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CONTENT

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INTRODUCTION

In 1987, Wegner, Schneider, Carter, and White described their, by now classic, "white bear" experiment. The goal of this experiment was to examine the efficacy of thought suppression. Participants were instructed to "try not to think of a white bear" (Wegner et al., 1987, p. 6) for 5 minutes. Results indicated that thought suppression is an ineffective strategy to control one's thoughts since participants thought approximately 7 times about white bears despite suppression instructions. Furthermore, suppression instructions were found to result in more white bear thoughts later on (when suppression instructions were no longer applicable). The latter phenomenon is referred to as the "rebound" effect of thought suppression. The results gave rise to the conclusion that thought suppression, apparently, is an ineffective coping strategy. The paradoxical effects of thought suppression (i.e., the immediate failure and the rebound effect) have since then been proposed as an explanation for, amongst others, obsessions as occurring in Obsessive-Compulsive Disorder (OCD; American Psychiatric Association [APA], 1994). By this view (Wegner, 1989), people who experience an unpleasant intrusion may engage in thought suppression and, consequently, suffer from more intrusions, which will ultimately lead to a constellation of features that meet the criteria for OCD listed in the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV; APA, 1994).

Obsessive-Compulsive Disorder

Although the original status of the thought suppression paradigm may have been that of an explanatory model for OCD, its present-day application appears to be much broader. Furthermore, alternative models for OCD have been proposed. To clarify the scope of the studies presented in this thesis, some general remarks about OCD are in order. Obviously, obsessions and compulsions are the key features of OCD. Obsessions can be defined as "recurrent and persistent thoughts, impulses, or images that are experienced, at some time during the disturbance, as intrusive and inappropriate and that cause marked anxiety or distress" (APA, 1994, p. 422). DSM-IV defines compulsions as "repetitive behaviors (e.g., hand washing, ordering, checking) or mental acts (e.g., praying, counting, repeating words silently) the goal of which is to prevent or reduce anxiety or distress, not to provide pleasure or gratification. In most cases, the person feels driven to perform the compulsion to reduce the distress that accompanies an obsession or to prevent some dreaded event or situation" (APA, 1994, p. 418). The diagnosis of OCD requires that the obsessions and/or compulsions cause distress, interfere with daily activities, or are time consuming (i.e., take more than one hour per day). According to Bebbington (1998), the point-prevalence of OCD in the general population is approximately 1% for men and 1.5% for women (see also Kessler et al., 1994).

The causes of OCD can be studied at various levels. The most obvious question would be where the intrusive thoughts come from. Katz (1991) offers a "biological Freudian" explanation for the occurrence of intrusions. According to this theory, numerous unconscious thoughts are constantly active in currently not accessed regions of our mind. A neurotransmitter called serotonin is

involved in the regulation of these unconscious dynamics (i.e., keeping them unconscious). If, for some reason, a serotonergic deficiency occurs, the brain is no longer able to prevent irrelevant thoughts and impulses from entering consciousness. Thus, a cognitive disinhibition occurs. A lack of serotonin may also explain the occurrence of compulsions, in that repetitive behaviours may help to restore serotonergic activity. In this line of reasoning, compulsions are a means to reach a serotonergic equilibrium. Jacobs (1994) concludes: "Since our results show that repetitive motor-acts increase serotonin neuronal activity, patients with this disorder may be engaging in repetitive rituals such as hand washing or pacing as a means of self-medication. In other words, they have learned to activate their brain serotonin system in order to derive some benefit or rewarding effect, perhaps the reduction of anxiety" (p. 462).

Although the serotonin hypothesis may contribute to our understanding of OCD, there are several problems with this account. For example, serotonin deficiency is not specific for OCD, but is also associated with depression and aggression (Jacobs, 1994). Our current scientific techniques do not allow us to distinguish between possible differential manifestations of serotonergic malfunctions. Furthermore, the idea that repetitive behaviours should be construed as self-medicating motor activities is not in line with the notion that compulsions generally occur as voluntary reactions to obsessive intrusions. Thus, self-medicating movements are more reminiscent of apparently pointless and automatic behaviours as seen in Tourette's Disorder and Trichotillomania (APA, 1994).

A different research line addressing the origin of compulsions focuses on possible memory deficits in OCD patients. Basic hypothesis is that people who excessively check may do so because they can not remember whether they actually checked previously or whether they just imagined doing so (see McNally & Kohlbeck, 1993). There are, indeed, some indications that obsessive checking is associated with (neuropsychological) memory impairments (Tallis, 1997; Tallis, Pratt, & Jamani, 1999; Wilhelm, McNally, Bear, & Florin, 1997). However, there is no evidence to suggest that these memory impairments are causal factors in the development of compulsive behaviours (Tallis et al., 1999). McNally and Kohlbeck (1993) argue that OCD patients do not suffer from memory impairment per se, but rather from decreased confidence in their own memory (see also MacDonald, Antony, MacLeod, & Richter, 1997). Yet, another association was reported by Radomsky and Rachman (1999). These authors found that OCD patients are better than other anxiety patients and non-clinical controls when it comes to remembering a list of 25 items that were allegedly contaminated. In short, the association between OCD and global memory impairment is far from clear.

Meanwhile, the question arises whether looking for causes of intrusions is a fruitful endeavour. From the work of Rachman and De Silva (1978; see also Salkovskis & Harrison, 1984; Muris, Merckelbach, & Clavan, 1997) it is known that intrusions are not specific for OCD. These authors noted that a majority of people in the normal population (i.e., 80%) experiences intrusions similar to those seen in OCD. Differences between "normal" and "abnormal"

intrusions were found with respect to frequency, intensity, duration, discomfort, and resistance, with clinical intrusions being more strongly characterised by these dimensions than everyday intrusions. From a clinical viewpoint, these findings suggest that scientific attention should not (only) be directed at possible causes of intrusions, but (also) at the factors that encourage the transformation of everyday intrusions into pathological obsessions. Two major theories have addressed the latter issue. First, the cognitive theory of obsession proposes that the interpretation given to intrusions determines whether these intrusions develop into obsessions (Salkovskis, 1985). Second, the thought suppression paradigm predicts that inadequate coping styles contribute to the development of obsessional intrusions. The studies presented in this thesis focus on thought suppression as a causal factor in OCD, while the cognitive theory of obsession provides a broader context for these studies.

Reasons to suppress obsessional intrusions

As mentioned before, Wegner (1989) originally introduced the paradoxical white bear effect as an explanation for obsessions. According to Wegner (1989), "an obsession can grow from nothing but the desire to suppress a thought" (p. 167). By this view, the increase in the number of intrusive thoughts is already a feature of OCD in itself, but may furthermore lead to more distress and interference with daily life. Interestingly, according to Wegner et al. (1987), people may not only suppress unpleasant thoughts, but also neutral or even pleasant intrusions that are simply inappropriate in certain situations. Wegner (1989) holds that even such neutral or pleasant thoughts may acquire obsessive qualities, merely by means of suppression. Although this may be true, there are some indications that emotionally laden thoughts are more susceptible to the paradoxical effects of thought suppression than are neutral thoughts (but see Harvey & Bryant, 1998a; Petrie, Booth, & Pennebaker, 1998). Furthermore, it seems plausible that, generally, emotional thoughts will give more rise to suppression attempts than do neutral thoughts.

With respect to OCD, an elaborated set of hypotheses has been formulated on what may make an intrusion emotionally salient. This compilation of hypotheses can best be referred to as the cognitive theory of obsession (Rachman, 1997, 1998a; Salkovskis, 1985). The core assumption of this theory is that the emotional value of intrusions largely depends on the interpretations given to the intrusions. These interpretations will be flawed if one suffers from certain cognitive biases. For example, most people may, at some point, wish harm on someone else. Such an intrusive thought will be experienced as slightly immoral by most people, but it will be perceived as highly disturbing by people who live by biased rules like "wishing harm is morally equivalent to doing harm", "thoughts predict future events", "intrusive thoughts uncover my real self", or "I can and must exert complete control over my thoughts". These biases can easily result in an inflated significance attached to intrusive thoughts. Thus, intrusive thoughts may be perceived as alarming, discomforting, and resistance provoking. Accordingly, the cognitive theory of

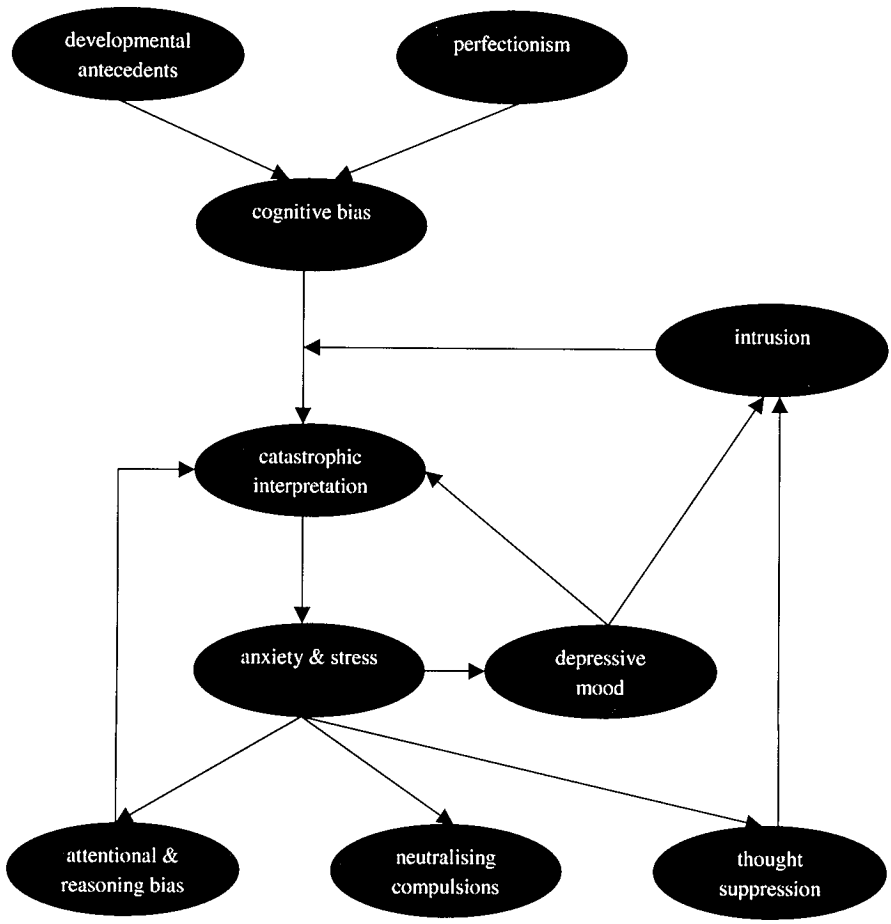
obsession implies that the presence of a cognitive bias suffices to add obsessional qualities to intrusive thoughts.

Hence, the cognitive theory of obsession may be considered to be a rival of the thought suppression paradigm in the explanation of the occurrence of obsessions. On the other hand, it may also be hypothesised that the processes described by both accounts can work together in the development of obsessive intrusions. Since the presence of a cognitive bias increases the significance attached to an intrusion, it may result in intensification of intrusions and in more efforts to suppress these intrusions. In Rachman's (1998a) words: "an inflated increase in the significance attached to an unwanted intrusive thought, such as an obsession, will lead to more vigorous and intense attempts to suppress such thoughts" (p. 393), and: "Given that patients can misinterpret the frequency with which they experience the obsession as evidence for the importance of the obsession (...), paradoxical increases in frequency that arise from attempts at suppression, may actually strengthen the catastrophic misinterpretation themselves. A vicious cycle is established" (p. 394).

So far, little or no empirical research has been done on these possible interactions between cognitive biases and thought suppression (see Warren, Zgourides, & Jones, 1989). Nonetheless, thought suppression appears to fit well in the cognitive theory of obsession. Figure 1.1 provides a schematic representation of the place of thought suppression within the cognitive theory of obsession. At the beginning of the schema, two possible causes of cognitive biases are included. Salkovskis, Shafran, Rachman, and Freeston (1999) discuss a number of factors that may contribute to the development of a cognitive bias. An example of a developmental antecedent would be an incident in which one's thoughts appeared to contribute to a serious misfortune. For example, a child may wish someone dead, while soon afterwards, this person actually dies. This incident may lead the child to believe that its' thoughts possess predictive value. Alternatively, certain personality traits, such as perfectionism, may foster irrational cognitions, which stimulate catastrophic interpretations of intrusions. For example, the idea that the occurrence of unwanted intrusions predicts loss of mental control and development of serious mental illness can be interpreted as a perfectionism bias with obsession provoking effects. Several studies have indicated that perfectionism may be related to obsessional biases (Bouchard, Rhéaume, & Ladouceur, 1999; Frost, Steketee, Cohn, & Griess, 1994; Rhéaume, Freeston, Dugas, Letarte, & Ladouceur, 1995). Once a cognitive bias is active, certain intrusions (e.g., violent fantasies) will be catastrophically misinterpreted, resulting in stress and fear of the anticipated consequences. This anxiety may have several consequences such as attentional bias (see Clayton, Richards, & Edwards, 1999; Salkovskis, Forrester, & Richards, 1998), neutralising compulsions, cognitive avoidance (thought suppression), and depressed mood (see Rachman, 1997). Here, various positive feedback loops come into play, one of which revolves around thought suppression. The cognitive theory of obsession may well turn out to be of great help to our understanding of a subcategory of

obsessive-compulsive problems, that is problems that are caused by misinterpretations of intrusions.

Figure 1.1 *Possible pathways in the development of obsessive-compulsive problems (based on Rachman, 1997; Salkovskis, Forrester, & Richards, 1998).*



Traumatic intrusions

While intrusions are a crucial feature of OCD, they are also prevalent in several other disorders. For example, people who experience a traumatic incident and subsequently develop Acute Stress Disorder (ASD) or Post Traumatic Stress Disorder (PTSD) suffer from recurrent and intrusive recollections of the traumatic event (APA, 1994). Furthermore, like OCD, ASD and PTSD are characterised by conscious attempts at behavioural or cognitive avoidance (e.g., thought suppression; see, for overviews, Purdon, 1999; Rassin, Merckelbach, & Muris, in press). The possible consequences of suppression attempts in ASD and PTSD are farther-reaching than in OCD. That is, unlike discrete

obsessional intrusions, traumatic intrusions have their roots in elaborated pieces of autobiographical memory. Therefore, suppression of traumatic intrusions may not only affect the subsequent frequency of intrusions, but also the content of intrusions and memory.

Wegner, Quillian, and Houston (1996) investigated the role of thought suppression in the development of special features that generally characterise traumatic memories. More specifically, traumatic memories are regularly described as a collection of very vivid but isolated flashbacks, while, at the same time, other parts of the traumatic event are hard if not impossible to recall (Ehlers & Clark, 2000). Wegner et al. (1996) showed the participants in their experiment a film clip of approximately 10 minutes, and subsequently assigned them to one of three conditions: a suppression condition (in which participants were instructed to try not to think about the film clip during the remainder of the day), an expression condition (in which participants were instructed to try to think as much as possible about the film clip during the remainder of the day), and a no-instruction control condition. Five hours later, participants' memories of the film clip were tested. Results supported the hypothesis that thought suppression may be responsible for certain traumatic memory characteristics. That is, participants in the suppression group reported their memory of the film clip to be more fragmentary than did participants in the other groups. Furthermore, suppression participants performed less on questions pertaining to sequence memory (i.e., chronology of events in the film clip). These findings are interesting, because they open the door to the conclusion that dissociative amnesia may be the result of deliberate attempts to forget. Thus, the suppression paradigm may shed new light on the psychodynamic concept of repression. Wegner et al. (1996) conclude that "the snapshot effect of suppression suggests that people might indeed do something that resembles the effect attributed to classical repression" (p. 689).

Thesis outline

This thesis contains studies that aim at gaining further insight in the role of thought suppression in the development or maintenance of obsessive-compulsive symptoms. Furthermore, it contains a number of studies addressing the alleged memory undermining effects of thought suppression.

Chapter 2 reviews the literature on thought suppression. In this chapter, problems with the definition of thought suppression and intrusion are discussed. Also, the evidence for the causal and maintaining role of suppression in various psychopathological conditions (e.g., OCD, PTSD, and phobia) will be evaluated. Furthermore, the relation between suppression and episodic memory will be addressed. Chapter 2 concludes with a discussion of the clinical implications of thought suppression research and with guidelines for future research.

Chapter 3 consists of studies that aim at combining the thought suppression paradigm with the cognitive theory of obsession. The first study pertains to possible associations between thought suppression and ritualistic behaviours. Next, an experimental analysis of a cognitive bias known as "thought-action

fusion" (TAF) is presented. The third study discusses possible associations between cognitive biases and thought suppression. Lastly, a study on cognitive biases and thought suppression tendencies in OCD patients will be presented.

Chapter 4 addresses the effects of thought suppression on memory. This chapter contains two experiments comparable to those reported by Wegner et al. (1996), and a correlational study on self-reported suppression tendencies and idiosyncratic traumatic experiences.

In chapter 5, the main findings of the various studies are summarised and general conclusions will be drawn.

2

PARADOXICAL AND LESS PARADOXICAL EFFECTS OF THOUGHT SUPPRESSION: A CRITICAL REVIEW

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Abstract

The process of consciously trying to avoid certain thoughts is referred to as thought suppression. Experimental research has documented that thought suppression may have paradoxical effects in that it leads to an increased frequency of the to-be-suppressed thought intruding consciousness. It has also been claimed that suppression has disruptive effects on episodic memory (i.e., a less paradoxical effect). The present article critically evaluates studies on the paradoxical and less paradoxical effects of thought suppression. More specifically, the issue of whether thought suppression plays a causative role in the development of various psychopathological symptoms is addressed. While laboratory studies have come up with highly consistent findings about the paradoxical effects of thought suppression, there is, as yet, little reason to believe that such effects are implicated in the aetiology of obsessions, phobias, or other psychopathological conditions. Relatively little work has been done on the alleged memory effects of thought suppression. The studies that have examined this issue have found mixed results. Accordingly, the case for the amnestic power of thought suppression is weak. Alternative explanations and competing theories are discussed and it is concluded that research concerned with the psychopathological consequences of thought suppression would benefit from the development of better taxonomies of intrusive thinking and cognitive avoidance strategies.

In clinical literature, the term "repression" may have various meanings. Yet, in most cases, it refers to defensive manoeuvres that expel unwanted thoughts from conscious awareness. In a number of case studies, Sigmund Freud sought to document the pathogenic effect of repression. The hysteria of Dora, the phobia of Little Hans, the obsession of the Ratman, all these anecdotal testimonies were presented by Freud as support for the notion that repression is the vehicle behind highly diverse manifestations of psychopathology. Consider the example of the Ratman (S. Freud, 1955). This patient was plagued by the following obsession: he imagined punishing his father by fastening a pan with rats to his father's rectum. How is it possible that someone suffers from such a bizarre intrusion? Freud came up with this explanation: during his youth, the Ratman systematically repressed aggressive thoughts about his father, but as he grew older the repressed material surfaced in the form of a pathological obsession. According to Freud, the Ratman is a prototypical example of the antecedent role of repression in the development of psychopathology. Anna Freud further elaborated this idea and claimed that "Repression is the most dangerous defence mechanism (...) Repression is the basis for the formation of neurosis" (A. Freud, 1946, p. 44). She argued that repression is an unconscious, automatic process. By this view, the person does not know that he/she tries to avoid certain thoughts (see, for an extensive analysis, Erdelyi, 1993).

To date, many research psychologists would argue that the Freudian view on repression is problematic. For example, Holmes (1990, p. 96) summarised a large body of experimental studies concerned with repression and concluded that "despite over sixty years of research involving numerous approaches by many thoughtful and clever investigators, at the present time there is no controlled laboratory evidence supporting the concept of repression". A similar conclusion was reached by Eysenck (1985), who in his "Decline and fall of the Freudian empire" carefully reviewed research on repression and other Freudian concepts. Eysenck concluded that "what emerges again and again from examination of the empirical and experimental literature is that authors practically always fail to look at their studies and results from the point of view of psychological theory, to see whether they could have been predicted as well, or better, in terms well known to academic psychologists, rather than in Freudian terms" (1985, p. 159, 160).

Unlike automatic and unconscious repression, deliberate attempts to remove thoughts from consciousness lend themselves much easier to experimental analysis. Wegner (1989) termed this type of mental avoidance "thought suppression", but the phenomenon was already extensively described by William James (1890). James assumed that an unwanted cognition can be avoided (suppressed) by shifting one's attention to another thought. He believed that in this way, people can regulate and control their stream of consciousness. Wegner is less optimistic about this possibility. He maintains that the mental control that people can exert over their stream of consciousness is limited. To illustrate this point, he asked undergraduates to suppress all thoughts about a cup of coffee for a 30-second period. Whenever the students thought about a cup of coffee, they had to ring a bell. The average frequency

with which students thought about the to-be-suppressed item was 3.7. Interestingly, when undergraduates were instructed to concentrate on thinking about a cup of coffee for 30 seconds, their thoughts wandered away with an average frequency of 3.3 times. These findings led Wegner (1989) to conclude that people are not able to control their thoughts for periods longer than 10 seconds. He also noted that thought suppression has a paradoxical effect in that it enhances the frequency with which the suppressed thought surfaces in the stream of consciousness. This paradoxical effect would suggest that suppression may have a pathogenic potential. In the words of Wegner, Schneider, Carter, and White (1987, p. 12): "The observed processes, though fairly tame in the laboratory, might conceivably create powerful mental preoccupations in natural settings".

This article reviews paradoxical and some less paradoxical effects of thought suppression and critically evaluates the claim that they play an antecedent role in certain manifestations of psychopathology. The article is structured as follows. First, experimental studies concerned with the paradoxical consequences of thought suppression are summarised. Next, the issue of thought suppression as a coping style or individual difference factor is addressed. In addition, evidence for the link between thought suppression and psychopathological phenomena is critically discussed. Then, potential treatment implications of research on thought suppression are addressed. The article closes with a brief discussion of fruitful research avenues for future studies.

The paradoxical effects

The basic phenomena

Systematic research on thought suppression only started after Wegner and co-workers (1987) published their by now classic "white bear" experiments. The general outline of their critical experiment was as follows. Normal participants were assigned to one of two groups. The first group was an "initial suppression" group in which participants were instructed to suppress the thought of a white bear for a 5-minute period. Following this, participants were given expression instructions, that is, they were asked to think about a white bear during a 5-minute period. In the second group, termed the "initial expression" group, the order of instructions was reversed. Here, participants first engaged in expression and then in suppression. Participants had to ring a bell whenever they thought of the target. Wegner and co-workers found that thought suppression produced an immediate enhancement effect. By and large, participants who had received suppression instructions were unable to completely suppress the target thought: the mean frequency of white bear-thoughts during the suppression period was 6.8. Furthermore, during expression, participants were found to think more intensively about a white bear (i.e., they rang the bell more frequently) when they had previously engaged in thought suppression. Apparently, then, suppression of an unwanted thought not only produces immediate enhancement, but also results in a higher

frequency of this thought later on. Wegner (1989) referred to the latter phenomenon as "the rebound effect of thought suppression".

Thus, the pioneering work of Wegner (1989) showed that the paradoxical effects of thought suppression can manifest itself in two forms: an immediate and/or a delayed increase in the target thought. A number of subsequent studies have replicated both phenomena. For example, using "vehicle" in stead of "white bear" as a target thought, Lavy and Van den Hout (1990) reported an immediate enhancement effect similar to that described by Wegner et al. (1987). As another example, Clark and colleagues (Clark, Ball, & Pape, 1991; Clark, Winton, & Thynn, 1993) found that suppression of "green rabbit" thoughts produced a heightened level of intrusions about the pertinent item during a subsequent suppression-free period (i.e., a rebound effect).

Muris and Merckelbach (1991) collected data suggesting that the rebound effect of thought suppression is maintained over longer time intervals. In their study, undergraduates were asked to read a transcription of Freud's Ratman case (cf., supra). Half of the participants were then instructed to avoid all thoughts about this transcription for a 10-minute period, while the other half were free to think about anything. After 1 week, all participants were interviewed about how often they had had thoughts related to the transcription over the past week. Participants who had engaged in suppression reported more thoughts (4.6) about the Ratman transcription than did control participants (2.0). Paradoxical effects of thought suppression are not restricted to situations in which people suppress personally irrelevant targets (e.g., white bears or other people's obsession). For example, Roemer and Borkovec (1994) noted that suppression of personally relevant anxious or depressing themes leads to a subsequent enhancement of these themes. Although not all researchers were able to replicate the immediate and/or delayed paradoxical effects following suppression (e.g., Kelly & Kahn, 1994; Muris, Merckelbach, Van den Hout, & De Jong, 1992; Smári, Sigurjónsdóttir, & Sæmundsdóttir, 1994; Wegner, Quillian, & Houston, 1996), the bulk of the literature suggests that these effects are quite robust.

One may argue that paradoxical effects of thought suppression are artefacts elicited by, for example, instructions to ring a bell whenever the unwanted thought occurs. However, paradoxical effects of thought suppression can also be documented when participants give *aposterio* estimates of the frequency of the to-be-suppressed material (e.g., Clark et al., 1991). In general, individuals seem to be very sensitive to frequency information. For example, Brown (1990) had her participants rate the frequency of appearance of actors in a TV soap and found that the correlation between subjective frequency estimates and actual time on screen approached .91. Note further that paradoxical effects of thought suppression are not limited to self-reported frequencies, but may also become apparent at a behavioural level. Germane to this issue is a study by Cioffi and Holloway (1993) who noted that suppression of pain sensations has paradoxical effects on recovery from pain. These authors examined thought suppression effects in participants who underwent a cold pressor task. In this study, participants were assigned to one of three conditions: suppression,

distraction, and monitoring (i.e., paying close attention to physical sensations) and then had to carry out a cold pressor task. That is, they were instructed to keep their hand in ice water for as long as they could tolerate. After this task, participants had to rate levels of post-pressor pain on Visual Analogue Scales (VASs). Results showed that suppression participants had significantly higher VAS-ratings, indicating that they recovered more slowly from pain than distraction and monitoring participants. Furthermore, in anticipation of a second cold pressor task, participants who had previously engaged in suppression, displayed a greater heart rate acceleration and lower self-efficacy to withstand the task than did participants in the other conditions. As another example, Wegner, Shortt, Blake, and Page (1990) demonstrated that suppression of an exciting thought, promotes physiological reactivity as indexed by heightened skin conductance levels. Interestingly, behavioural consequences of thought suppression have also been documented in social psychology literature. Macrae, Bodenhausen, Milne, and Jetten (1994) conducted an experiment in which they showed their participants a photograph of a male skinhead. Participants were invited to describe what a typical day of the person in the photo may look like. Half of the participants were instructed to avoid stereotypic ideas about skinheads while engaging in that task. The other half were given no such instructions. Following this, participants were told that they would meet the skinhead. In anticipation of this meeting, they were asked to take a seat. Participants were free to choose between seven seats. The eighth seat was evidently occupied by the skinhead, as a jacket and a bag were on it. Participants who had been instructed to avoid stereotypic ideas and control participants were compared to each other with respect to two dependent measures, namely, the frequency of stereotypes in the descriptions of a typical day of the skinhead and preferred seating position. While suppression participants gave less stereotypes in their descriptions than did controls, they preferred to sit further away from the skinhead's belongings than control participants. Thus, these results suggest that suppression of stereotypic thoughts does result in a paradoxical rebound effect at a behavioural level. Taken together, these findings indicate that artefactual explanations of the paradoxical effects of suppression are themselves open to question.

Why do paradoxical effects occur?

Wegner (1989) speculated that when people try to avoid a certain thought, they often do so by shifting their attention to an irrelevant environmental item. However, the target thought will come to mind during such distraction attempts and consequently, the initially irrelevant item (the distracter) becomes associated with the target thought. In this way, the irrelevant item is converted into a retrieval cue for the to-be-suppressed information. Hence, the person will look for a new distracter. Iteration of this associative process results in a higher frequency of intrusions, simply because the person will find himself surrounded by various stimuli that remind him of the to-be-suppressed thought. Evidence for this so-called "environmental cueing" process comes from an experiment in which the external distracters were manipulated (Wegner, Schneider, Knutson, & McMahon, 1991; see also Muris, Merckelbach, & De Jong, 1993). While

engaging in suppression of white bear thoughts, participants watched a series of slides. Following suppression, they were instructed to think about a white bear. When this was done in the context of the series of slides that were initially shown, a rebound effect occurred. Yet, when the context was changed, by showing a new series of slides, no rebound was observed.

Recently, Wegner (1994) formulated a more elaborated version of the environmental cueing hypothesis. According to this more recent version, thought suppression activates two opposing processes. The first one is a conscious and effort demanding "operating process" that searches continually for distracting stimuli. The second one is an unconscious and relatively effortless "monitoring process" that is sensitive to occurrences of the unwanted thought. This monitoring process is triggered by attempts to control the stream of consciousness and is maintained until such attempts are given up. As the operating process is a conscious and capacity limited process, it suffers from concurrent operations that require cognitive effort. In contrast, the monitoring process is relatively unaffected by other mental operations. This difference may lead to an imbalance, in which the monitoring process overrules the operating process, which in turn results in an increased detection of unwanted thoughts. Indirect support for Wegner's theory comes from studies (e.g., Wegner & Erber, 1992) demonstrating that thought suppression is less effective when participants are involved in a concurrent task that also requires the operating process. For example, participants who carry out a word association task with time pressure, are less capable of suppressing a thought than participants who carry out a word association task without time pressure. Emotions are also said to interfere with optimal functioning of the operating process. By this view, anxious or depressed individuals would be less successful in suppressing unwanted thoughts (Wenzlaff, Wegner, & Roper, 1988). Interestingly, Bowers and Woody (1996) found evidence to suggest that the paradoxical effects of thought suppression fail to occur in hypnotised individuals, an observation that makes sense if one assumes that hypnosis promotes a state in which the intentional operating process is bypassed.

Directed forgetting

Remarkably, a completely different line of research referred to as "directed forgetting" indicates that when participants receive a "forget" instruction, they *can* successfully forget target stimuli (see, for an overview, Johnson, 1994). In directed forgetting experiments, participants are presented with two separate lists of words. One of these lists is to be forgotten, while the other is to be memorised. After a short delay, participants are asked to recall all words, including those presented in the forget-list. In general, participants reproduce more items from the remember-list than from the forget-list. The directed forgetting paradigm can be extended by varying the emotional valence of the words. For example, both lists may contain positive (e.g., "merry") and negative words (e.g., "anxious"). Strikingly, the directed forgetting effect tends to be greater for negative than for positive words, especially in so-called repressors, that is, individuals who are highly defensive and at the same time low-anxious (Myers, Brewin, & Power, 1998). These results seem to indicate

that people can forget target stimuli, especially negative target stimuli when they are instructed to do so. It is worth noting that studies concerned with the rebound effect of thought suppression have often failed to find such an interaction between avoidant strategies and target valence (e.g., Harvey & Bryant, 1998a; Roemer & Borkovec, 1994). In fact, the finding that thought suppression elicits paradoxical phenomena in negative, neutral, and positive target material led Harvey and Bryant (1998a) to conclude that thought suppression may not be a valid paradigm for clinical intrusions. Thus, in several respects, directed forgetting research seems to contradict literature on thought suppression. It is important to stress, though, that there are important technical differences between directed forgetting and thought suppression paradigms. Most importantly, in directed forgetting experiments, the forget-list is presented as a practice task that precedes the real memory task. For example, Myers and colleagues (1998, p. 143) instructed their participants as follows: "What you have done so far has been practice. You can forget about those words. I will now show you the actual set of test words ...". Yet, in a suppression experiment, the instruction might have been more like: "I want you not to think about the words I have just shown you". These instructions communicate quite different actions. In directed forgetting, participants are allowed to ignore the targets, while they should concentrate on words presented on a subsequent remember-list. Thus, participants are given a strong distracter for a target that has been trivialised. In contrast, in suppression studies, the target thought is made outstanding by the simple act of presenting it as the to-be-suppressed target, while no distracter is provided. The consequence of this is that individuals attend to a large array of environmental stimuli that become retrieval cues of the to-be-suppressed thought. Interestingly, Wegner and associates (1987; exp. 2) noted in a follow-up experiment that a rebound effect of suppression does not occur when participants are given instructions to focus on one single, outstanding distracter (e.g., red Volkswagen) whenever the to-be-suppressed thought comes to mind. This suggests that distracters may, indeed, play a vital role in whether or not suppression produces a preoccupation with the target material.

The technical differences between directed forgetting and thought suppression paradigms may explain the conflicting results that these two research lines have generated. Meanwhile, the question arises which paradigm is more ecologically valid as a model for real life obsessive intrusions. It is intuitively plausible to argue that thought suppression has more everyday equivalents than does directed forgetting. Even so, the precise differences between both paradigms warrant further study. So far, research on thought suppression has largely ignored the phenomenon of directed forgetting.

Thought suppression and psychopathology

Individual differences in thought suppression tendencies

Results obtained by Merckelbach, Muris, Van den Hout, and De Jong (1991) indicate that people differ in how successful they are at thought suppressing. These authors found a positive relationship ($r = .59$, $n = 35$, $p < .001$) between

the number of intrusions during suppression and the frequency of intrusions during control periods (see also Rutledge, Hollenberg, & Hancock, 1993). That is, individuals who reported a high frequency of intrusions when they tried to suppress a certain thought, also displayed a stronger rebound effect during subsequent suppression-free periods. This suggests that an individual difference factor is at work in the paradoxical effects of thought suppression.

To measure individual differences in the motivation to suppress unwanted thoughts across a wide range of situations, Wegner and Zanakos (1994) developed a 15-item questionnaire that they termed the White Bear Suppression Inventory (WBSI). Typical examples of WBSI items are: "I wish I could stop thinking of certain things" and "I have thoughts that I cannot stop". WBSI items are scored on 5-pointscales (anchors: 1 = *strongly disagree*; 5 = *strongly agree*). A total score is calculated by summing across the items. Accordingly, a high WBSI score would indicate a strong tendency to suppress unwanted thoughts. Wegner and Zanakos as well as Muris, Merckelbach, and Horselenberg (1996) found that the psychometric qualities of the WBSI are satisfactory. To illustrate, in the Muris et al. study, internal consistency of the WBSI was good (Cronbach's $\alpha = .89$; $n = 172$) and test-retest stability (12-weeks interval) proved to be adequate ($r = .80$, $n = 40$, $p < .001$). That study also found that participants with high WBSI scores subsequently report more intrusions in an experimental thought suppression set-up than participants with low WBSI scores, suggesting that the WBSI possesses predictive validity. Taken together, it is safe to assume that the WBSI is sensitive to individual differences in the extent to which people rely on thought suppression as a general mental control strategy. As people who try to suppress unwanted thoughts are, in fact, very poor at it, Wegner and Zanakos (1994) reasoned that a chronic and generalised tendency to suppress thoughts may serve as a risk factor for psychopathological conditions. In their words (1994, p. 619): "chronic thought suppression should cause symptoms of obsession, depression, and anxiety". We now turn to studies that sought to explore the psychopathological ramifications of thought suppression.

Obsessive-Compulsive Disorder

There are reasons to believe that the paradoxical effects of thought suppression are not restricted to the laboratory. According to Wegner (1989, p. 167), suppression may contribute to the obsessive nature of an initially relatively harmless (non-traumatic) thought: "An obsession can grow from nothing but the desire to suppress a thought". Thus, Wegner claims that the vicious circle of suppression, rebound, and again (more) suppression, and (more) rebound may be sufficient to transform a neutral thought into an obsessive intrusion.

Indirect support for the idea that thought suppression plays a role in the development of pathological obsessions comes from various sources. To begin with, Muris et al. (1996) found in a non-clinical sample a significant correlation ($r = .35$, $p < .001$) between WBSI scores and scores on the Maudsley Obsessional-Compulsive Inventory (MOCI). A similar correlation was reported by Wegner and Zanakos (1994). Following a different research strategy, Trinder and Salkovskis (1994) found evidence to suggest that suppression

contributes to the development of obsessions. These authors asked healthy volunteers to identify a recent negative intrusive thought. Next, participants were assigned to one of three conditions: a suppression group, an expression group (in which participants were instructed to think explicitly about the identified thought whenever it occurred), and a no-instruction group. Participants were told to record for a 4-day period the number of times the pertinent thought intruded their consciousness as well as the degree of discomfort whenever this happened. Thereto, they were given a postcard on which they were instructed to put a tick every time the thought came to mind. Suppression participants reported more intrusions and greater discomfort than control participants. This suggests that suppression not only leads to a heightened frequency of intrusions, but may also change the emotional evaluation of the intrusion.

Smári, Birgisdóttir, and Brynjólfsdóttir (1995) found in a non-clinical sample that high scores on the MOCI predict a relatively strong paradoxical effect of suppression instructions. In participants scoring low on the MOCI, such an effect was absent. Further evidence for the link between suppression and obsession is of a more inferential nature and can be found in, for example, the often cited Rachman and De Silva (1978) study on normal and abnormal obsessions. One of the main conclusions of that study was that obsessive intrusions in Obsessive-Compulsive Disorder (OCD) patients and normals have a highly similar content, yet, do differ in terms of frequency, intensity, discomfort, and, most pertinent to the present discussion, resistance (or if one likes: suppression). The fact that the content of intrusive thinking does not differentiate between normal and clinical obsessions points in the direction of a continuum between both categories of obsessions. Aspects like the urge to resist obsessions rather than their content would characterise the clinical range of this continuum (see also Rachman, 1997). The pioneering work of Rachman and De Silva was replicated by Salkovskis and Harisson (1984). These authors also noted a close link between resistance and frequency of obsessive intrusions.

Recent studies suggest that thought suppression may also be involved in compulsive behaviours. For example, Muris, Merckelbach, and Clavan (1997) compared rituals of normal participants with those of OCD patients. As is true for obsessive intrusions, normal and abnormal compulsions were found to be highly similar in content. Yet, the two categories of rituals did differ in terms of frequency, intensity, discomfort, and, again, resistance. A study by Rassin, Merckelbach, Muris, and Stapert (1999) further investigated the relationship between thought suppression and ritualistic behaviours in normal participants. More specifically, these authors examined rituals of participants with high and low WBSI scores. As expected, high WBSI participants experienced their rituals as more intense, more discomforting, and more resistance provoking than low WBSI participants. These findings are consistent with the notion that thought suppression plays a role in the development of pathological compulsion.

The question arises whether thought suppression and its paradoxical effects really act as antecedents in the aetiology of pathological intrusions and rituals. Although the research discussed above strongly suggests such a causal link, there are more articulated accounts of the development of OCD symptoms. For example, some authors (Rachman, 1993, 1997, 1998a; Shafran, Thordarson, & Rachman, 1996) have pointed out that a certain type of cognitive bias known as thought-action fusion (TAF) rather than suppression per se underlies the aetiology of pathological obsessions. Briefly, TAF refers to an overvaluation of intrusive thoughts, such that unwanted thoughts are appraised as equivalents of unwanted actions. An example would be the belief that unacceptable thoughts are as bad as the actual actions they describe. It is easy to see how TAF could contribute to an inflated sense of responsibility and, subsequently, to suppression and neutralisation attempts. Thus, according to this analysis, the primary antecedent of obsessive intrusions would be TAF, while suppression can be conceptualised as a secondary and possibly counterproductive reaction to TAF-intrusions. A recent laboratory study by Rassin, Merckelbach, Muris, and Spaan (1999) explored the effects of experimentally induced TAF. In this experiment, adolescent participants underwent a bogus EEG recording session. Participants in the experimental group were informed that the apparatus was able to pick up the word "apple" and that thinking of that word could result in the administration of electrical shocks to a person in an adjacent room. Participants in the control group were told that the EEG equipment was sensitive to "read" simple words such as "apple" and were asked to sit quietly and relax. After having spent 15 minutes in the EEG laboratory, experimental and control participants completed a short questionnaire containing items about characteristics (e.g., frequency, aversiveness) of the target thought. Results showed that participants in the experimental group reported a higher frequency of target thoughts, more discomfort, and a greater urge to suppress compared to participants in the control group. These findings are consistent with the idea that TAF promotes intrusive thinking and that it precedes suppression attempts. Such an interpretation is further supported by a recent study by Rassin, Muris, Schmidt, & Merckelbach, 2000). In that study, 173 students completed the TAF-scale (Shafran et al., 1996), WBSI, and MOCI. Structural equation modelling was used to explore the best fitting causal relationships between the scores on these scales. Results suggested that a TAF bias triggers suppression tendencies, while these tendencies increase obsessive-compulsive symptoms. Thus, again, the interpretation of intrusions (i.e., the TAF bias) seems to be a more fundamental cause of obsessive-compulsive symptoms than the tendency to suppress intrusions. Given these preliminary results, there is a clear need for future studies in which TAF and suppression are manipulated simultaneously. Such parametric studies could shed further light on the precise dynamics between these factors.

Generalised Anxiety Disorder, phobia, and depression

Becker, Rinck, Roth, and Margraf (1998) examined effects of suppression in patients with Generalised Anxiety Disorder (GAD) and normal controls. While GAD patients and controls did not differ in their ability to suppress neutral

material (e.g., white bears), GAD patients found it harder to suppress thoughts about their recent worries. More specifically, GAD patients displayed an immediate enhancement effect when they tried to suppress their main worry, whereas controls did not show such an effect. The authors take this as evidence to conclude that "patients with GAD do indeed suffer from a lack of mental control regarding their worries" (Becker et al., 1998, p. 51). But, of course, these findings do not show that thought suppression is the vehicle behind worries in GAD. Indeed, in literature, a radically different perspective on GAD (e.g., Dugas, Gagnon, Ladouceur, & Freeston, 1998) can be found, a perspective which conceptualises worrying as a cognitive reaction to intolerance of uncertainty. By this view, worrying is an act of avoidance of fear provoking imagery that develops as a consequence of ambiguous "what if" problems. Evidence to support this line of reasoning comes from the work of Borkovec and co-workers (e.g., Borkovec & Inz, 1990) who demonstrated that worrying has an inhibitory effect on physiological reactivity to phobic imagery. This suggests that rather than being preceded by mental avoidance manoeuvres such as suppression worrying *is* an act of mental avoidance.

Muris, De Jongh, Merckelbach, Postema, and Vet (1998) examined the role of thought suppression in dental phobia. Non-phobic and phobic patients were instructed to suppress or to express (i.e., think about) negative dentist-related thoughts while undergoing dental treatment. As expected, phobic patients exhibited higher levels of suppression and intrusive thinking than non-phobic patients. However, only in the non-phobic group, suppression instructions produced a significant enhancement in intrusive thinking and anxiety. The counterproductive effects of thought suppression did not occur in the phobic group. Comparable results were reported for another type of specific phobia, namely spider phobia (see Muris, Merckelbach, Horselenberg, Sijsenaar, & Leeuw, 1997). Thus, as things stand, there is no ground for suspecting that thought suppression plays an important role in the aetiology of phobias.

As to the link between suppression and depression, Kuyken and Brewin (1994) found in their cross-sectional study of depressed women that those women with particular high levels of intrusion and avoidance were also more severely depressed. Yet, as these authors themselves admit, the direction of causality awaits further study. Wenzlaff et al. (1988) noted that depressed individuals exhibit a deficit in the ability to suppress unwanted, negative thoughts. More specifically, their results show that the efficacy of depressed participants' suppression efforts is short-lived in that suppression attempts are accompanied by a resurgence of unwanted thoughts about the negative item (see, for similar findings, Conway, Howell, & Giannopoulos, 1991). Perhaps, then, depression undermines mental control over negative thoughts, thereby strengthening the paradoxical effects of thought suppression. But, note that in this analysis, suppression is a by-product rather than a determinant of depressive mood. This interpretation nicely fits with Rachman's (1981) view that dysphoria contributes to the persistence of intrusions by impairing mental control over these intrusions. Note that there is suggestive evidence for Rachman's position (e.g., Clark, 1992).

Addiction

A number of studies have explored whether suppression promotes smoke-related intrusions in ex-smokers. In an experiment by Salkovskis and Reynolds (1994), 62 ex-smokers were assigned to one of three groups: a suppression group (in which participants were instructed to suppress thoughts about smoking), a control group (in which participants just had to record thoughts about smoking), or a relaxation group (in which participants carried out breathing exercises that distracted them from smoking-related thoughts). Results demonstrated that all participants frequently experienced intrusive thoughts about smoking and that they had difficulty in controlling such thoughts. Yet, participants in the suppression group exhibited an increased frequency of intrusions compared to the other two groups. In a related study, Haaga and Allison (1994) retrospectively examined the connection between coping style and smoking relapse. The authors found that the strategies employed by ex-smokers to maintain abstinence in case of strong urges to smoke can be reduced to two broad coping styles: cognitive restructuring (e.g., thinking about negative health consequences) and thought suppression. Participants were interviewed on two occasions: three and twelve months after they had given up smoking. On both occasions, participants who successfully stopped smoking more often employed the strategy of cognitive restructuring, compared to participants who relapsed. This suggests that cognitive restructuring is a good predictor of successful smoking cessation, but it does not necessarily imply that thought suppression is involved in relapse.

Stronger evidence for the detrimental effects of thought suppression comes from Palfai, Monti, Colby, and Rohsenow (1997) who examined the role of suppression in heavy social drinkers. A group of heavy social drinkers were exposed to the sight and smell of their usual alcohol beverage. During this exposure, half of the participants were instructed to suppress their urge to drink alcohol, while the other half did not receive these instructions. Following this, participants carried out a cue reactivity task in which they were asked to make judgements about a series of alcohol outcome expectancies. Results showed that participants in the suppression condition were faster to endorse alcohol outcome expectancies following exposure to alcohol cues than participants in the control condition. Thus, suppression seemed to increase the accessibility of alcohol-related information.

Trauma-related psychopathology

While avoidance and intrusions are hallmark features of Acute Stress Disorder (ASD), there has been only one study investigating the effects of thought suppression in this condition. In that study, Harvey and Bryant (1998b) examined survivors of motor vehicle accidents with and without ASD. Participants monitored their trauma-related thoughts for three 5-minute periods. During period 1 (i.e., baseline), participants were allowed to think about anything. During period 2, participants were given either suppression or non-suppression instructions in relation to thoughts of the trauma. In period 3, participants were, again, instructed to think about anything. Results showed that ASD participants reported higher levels of anxiety, trauma-related

thoughts, and suppression than non-ASD participants. Most interestingly, ASD participants who were given suppression instructions, demonstrated a rebound effect, that is, an increased frequency of trauma-related intrusions in the period subsequent to suppression.

Like ASD, Post Traumatic Stress Disorder (PTSD) is characterised by intrusive thoughts about the traumatic incident and efforts to avoid such thoughts (American Psychiatric Association [APA], 1994). Amir, Kaplan, Efroni, Levine, Benjamin, and Kotler (1997) found that PTSD patients ($N = 46$) reported thought suppression to be the most frequent cognitive reaction to traumatic intrusions. In this regard, the PTSD patients differed from non-PTSD anxiety disorder patients and healthy controls. Apparently, then, ASD and PTSD patients try to rely on thought suppression to avoid recollections of their traumatic experience. As with obsession, one may speculate that such avoidance manoeuvres will generate more thoughts about the trauma (i.e., the paradoxical effect; see McFarlane, 1988). Evidence that adds weight to this view comes from a study by Lawrence, Fauerbach, and Munster (1996) who interviewed 23 burn patients on the day of their discharge from the hospital and at a 4-months follow-up. On both occasions, patients completed the Impact of Event Scale, a self-report scale measuring cognitive avoidance (i.e., suppression) and intrusive thinking. Avoidance at the time of discharge significantly predicted the occurrence of intrusions four months later ($r = .59$, $p < .01$). Similarly, Bryant and Harvey (1995) found in their sample of 56 motor vehicle accident victims that avoidance was significantly associated with intrusive thinking one year after the accident ($r = .56$, $p < .01$). As another example, Shipherd and Beck (1999) invited 36 women who were victims of sexual assault to participate in a suppression experiment. Seventeen of these women suffered from PTSD, while the remaining 19 did not completely fulfil DSM-IV criteria for PTSD, although they did suffer from subclinical PTSD symptoms. All women underwent three 9-minute periods, the first of which was spent thinking of anything. During the second period, women were instructed to suppress thoughts about the sexual assault. During the last period, women were told that they could think of anything including the assault. Results indicated that participants in both groups were equally successful in suppressing trauma-related thoughts. However, PTSD patients suffered from a rebound of intrusive thoughts during the third period, while controls did not display such a rebound effect.

While the studies summarised thus far seem to imply that in PTSD, suppression precedes intrusion, there are also longitudinal studies that found evidence for the opposite pattern. For example, Creamer, Burgess, and Pattison (1992) found that in 158 witnesses to a multiple shooting, avoidance predicted stress at four months, but not at 14 months after the trauma. On the basis of this observation, these authors noted that "intrusion precedes escape and avoidance, with the latter conceptualised as coping strategies, albeit often maladaptive, in response to discomfort that results from intrusive memories" (Creamer et al., 1992, p. 454). In a similar vein, Cella, Perry, Kulchycky, and Goodwin (1988) interviewed close relatives of hospital burn patients on three occasions: during

the acute phase of hospitalisation, at 7 weeks follow-up, and at 7 months follow-up. The data collected through these interviews led the authors to conclude that intrusive symptoms receded more rapidly than avoidant coping strategies. Note that these findings are consistent with the work of Foa, Riggs, and Gershuny (1992) on the structure of PTSD symptoms. Their work suggests that intrusions give rise to active avoidance rather than the other way around. These authors also concluded that many victims who do not meet the full criteria for PTSD report thought suppression and intrusions. It is the passive avoidance implicated in symptoms of numbing that differentiates victims with and without PTSD. Clearly, these findings cast doubt on the idea that thought suppression acts as an important antecedent in the radicalisation of PTSD symptoms.

Conclusion

The studies reviewed in this section demonstrate that thought suppression manoeuvres do figure in a wide variety of mental problems and disorders. Even so, the case for a pathogenic role of thought suppression in these disorders is weak. While the paradoxical effects of thought suppression were originally invoked to account for obsessive intrusions, a more recent and more sophisticated explanation emphasises the antecedent role of thought-action fusion, rather than thought suppression per se, in the development of obsessions. Likewise, in the case of worrying, there is an alternative conceptualisation that stresses intolerance of uncertainty as a precursor of worrying. Clearly, thought suppression does occur as an accompanying feature in phobias and depressive mood, but there is no reason to suspect that it has a causative status in these disorders. This might also be true for ASD and PTSD in which the temporal dynamics suggest that intrusions may fuel thought suppression rather than vice versa. The most robust evidence for the involvement of thought suppression in the radicalisation of symptoms comes from research on addiction and cue reactivity. Here, there are some indications that thought suppression may enhance cue reactivity and, consequently, may contribute to relapse. However, the preliminary character of the work in this domain precludes firm conclusions about the robustness of the link between thought suppression and relapse.

Thought suppression and memory

It is widely believed that adults who have experienced traumatic childhood events may cope with these experiences by engaging in selective suppression of traumatic memories (e.g., Brett & Ostroff, 1985; Terr, 1991, 1993). By this view, selective "forgetting" or thought suppressing would underlie psychogenic, or in DSM-IV terms dissociative, amnesia, that is, "an inability to recall important personal information, usually of a traumatic or stressful nature, that is too extensive to be explained by ordinary forgetfulness" (APA, 1994, p. 477). There are at least two reasons why this view is problematic. To begin with, it remains to be seen whether neurologically intact individuals can develop amnesia for traumatic events. For example, on the basis of an extensive review of retrospective and prospective studies, Pope, Hudson,

Bodkin, and Oliva (1998) concluded that the phenomenon of dissociative amnesia itself remains unproven. These authors point out that the main problem of studies with dissociative amnesia is that they equate non-reporting of trauma with dissociative amnesia, thereby ignoring the possibility that such non-reporting results from people's reluctance to disclose sensitive autobiographical material (see also Lilienfeld & Loftus, 1998). Second, even if it is taken for granted that dissociative amnesia exists, it is doubtful whether thought suppression would be the critical mechanism involved. Of particular relevance to this issue is Wegner and Erber's (1992) observation that suppression of target thoughts leads to hyperaccessibility of these thoughts. In their experiments, Wegner and Erber demonstrated that especially under conditions of high mental load, suppression of certain targets makes these targets extremely well retrievable during, for example, word-association or Stroop colour tasks. Findings such as these are difficult to reconcile with the idea that "the deliberate act of setting a memory aside leads easily to its permanent removal from consciousness" (Terr, 1991, p. 15). Much the same is true for the finding that women with parental abuse histories display an enhanced directed remembering rather than an enhanced directed forgetting of targets (e.g., negative words; Cloitre, Cancienne, Brodsky, Dulit, & Perry, 1996; see also McNally, Metzger, Lasko, Clancy, & Pitman, 1998).

While total dissociative amnesia is an unlikely scenario in traumatised people, incomplete recollections of traumas do occur. Germane to this issue is a study by Koss, Figueredo, Bell, Tharan, and Tromp (1996) who found that traumatic memories of rape victims are less clear and vivid, less detailed, and less likely to occur in the original order compared to memories of pleasant events. Although these characteristics can be attributed to an attentional narrowing effect during encoding (Wessel, 1997), Koss et al. argue that they might also originate from an avoidant coping style (e.g., thought suppression). In contrast to what one may expect on the basis of experimental thought suppression research, yet in line with the findings of Koss et al. (1996), recent studies have claimed that thought suppression may have memory undermining effects (Wegner et al., 1996). In the critical experiment, Wegner and associates (1996) exposed participants to a film fragment and then assigned them to one of three conditions: a suppression condition (in which participants had to suppress thoughts about the film), an expression condition (in which participants were encouraged to think about the film), and a no-instruction control condition. Five hours later, participants' memories about the film were tested. Results showed that whilst participants in all three conditions scored equally on questions about the content of the fragment, suppression participants performed significantly worse on questions addressing the chronology of events in the film fragment. Suppression also affected meta-memory representations of the film in that suppression participants thought more of the film as a collection of isolated pictures (i.e., snapshots) compared to participants in the expression and control conditions. While the observed effect was small and was restricted to memory for sequence of the film fragment, these results suggest that suppression may undermine episodic memory.

Accordingly, Wegner et al. (1996) contend that the memory-out-of-order effects of thought suppression might in extreme cases lead to partial (psychogenic) amnesia. In their words: "The snapshot effect of suppression suggests that people might indeed do something that resembles the effect attributed to classical repression (...) it does yield a new way to think about how traumatic events might conceivably be lost to memory" (Wegner et al., 1996, p. 689). Apart from the experimental evidence provided by the Wegner et al. study, there is some indirect evidence for the memory undermining effects of thought suppression. In two subsequent studies (Van den Hout, Merckelbach, & Pool, 1996; Muris & Merckelbach, 1997), a positive and significant correlation between the WBSI and the Dissociative Experiences Scale (DES) was found (r = .52 and r = .35, respectively). Frankel (1990, p. 827) has argued that a number of DES items "can be readily explained by the manner in which subjects recall memories". Thus, it may well be the case that the DES taps memory problems that occur in those individuals who have a strong tendency to suppress.

The less paradoxical, that is, memory undermining effect of thought suppression seems to run counter to the hyperaccessibility that characterises the paradoxical effects of thought suppression. Note, however, that there are important differences in the experimental set-up of studies concerned with memory effects of thought suppression and those concerned with hyperaccessibility effects. Whereas studies on the paradoxical effects of thought suppression focus on how thought suppression affects the frequency of relatively simple target thoughts, research on memory effects of thought suppression employs more complex stimuli such as film scenes. Nevertheless, Wegner and co-workers (1996) suggest several ways in which the paradoxical and memory disturbing effects of thought suppression might coexist. For example, these authors speculate that suppression promotes the hyperaccessibility of highly specific film scenes. The hyperaccessible scenes then become outstanding memory details that overshadow sequence information. While such an interpretation reconciles the hyperaccessibility and memory disturbing effects of thought suppression, several critical points can be raised. First, in the Wegner et al. (1996) study, suppression participants did not report an increased frequency of film-related thoughts. Thus, hyperaccessibility does not seem to be a *conditio sine qua non* for "memories-out-of-order". Second, Rassin, Merckelbach, and Muris (1997) failed to replicate the memory-out-of-order effect of suppression, although they did find a hyperaccessibility effect. The film fragment used by Rassin and colleagues differed in two important ways from the type of film scenes in Wegner et al. studies. First, it was of shorter duration (3 minutes versus 10 minutes in the Wegner et al. studies). Second, the fragment employed by Rassin et al. had an emotional content, whereas the Wegner et al. (1996) fragments were "interesting, but nontraumatic" (p. 682). The fact that thought suppression fails to produce a deficient memory of chronology when emotional material is involved, casts doubts on the speculation that thought suppression plays a role in partial amnesia.

In sum, then, while there is some circumstantial evidence to suggest that thought suppression has a negative effect on episodic memory, the precise details of this connection are not well understood. Further studies are needed to define the robustness, limits, and variations of the memory-out-of-order effect of thought suppression.

Implications for therapy

Wegner (1989, p. 174) is clear about the lessons for treatment to be learned from thought suppression studies: "in many cases of unwanted thought, it may be best to stop suppressing". According to Wegner, thought suppression experiments provide a straightforward rationale for habituation- or exposure-oriented treatments. In clinical literature, some good examples can be found that seem to underline Wegner's position. Thought stopping is a case in point. In thought stopping treatment, the patient is instructed to circumvent an obsessive intrusion by saying "stop" whenever it occurs. The efficacy of this intervention is, at best, modest (Marks, 1987), which is not surprising given the close parallels between thought suppression and thought stopping. Systematic exposure to obsessive intrusions appears to be a more promising treatment strategy. To illustrate, Salkovskis and Westbrook (1989) tape-recorded obsessive thoughts of their patients and then instructed these patients to listen to the tapes for several days at selected times. Patients were also taught how to refrain from covert avoidance tendencies (e.g., thought suppression). The combination of exposure and response prevention led to a decrease in obsessive thoughts and this positive outcome was maintained at long-term follow-up.

Taped habituation and prevention of thought suppression tendencies may also be fruitfully applied to other types of psychopathology. For example, Vaughan and Tarrier (1992) asked PTSD patients to describe their traumatic experiences and these descriptions were then audio taped. Patients were instructed to listen to the audio taped traumas for one hour per day over a 1-week period. They were also taught not to react with thought suppression to these tapes. Most of the patients benefited from treatment and this positive effect was maintained at 6-months follow-up. Likewise, Reynolds and Tarrier (1996) instructed PTSD patients to monitor their traumatic intrusions by keeping a detailed diary over a 2-months period. This resulted in an overall improvement such that at the end of the study, 4 out of 6 patients no longer met PTSD criteria. Thus, confrontation with and elaboration of unwanted, negative thoughts seem to be effective elements in the treatment of PTSD. This is further illustrated by studies in which individuals had to write about personally upsetting events over and over again (e.g., Pennebaker, 1993; see also Esterling, L'Abate, Murray, & Pennebaker, 1999). In general, positive outcomes in terms of physical and mental health have been reported in studies that relied on this diary method.

The studies cited above accord well with Wegner's (1989) suggestion that confronting an unwanted thought is a good starting point for treatment. However, this conclusion needs to be qualified. To begin with, it remains to be determined to what extent abstinence from thought suppression is a mediator of

therapeutic success in the treatment of obsessive or traumatic intrusions. For example, in a recent study, Petrie, Booth, and Pennebaker (1998) compared the effects of expressive writing and thought suppression. These authors assigned the participants in their study to either of 4 conditions. More specifically, one group of participants was invited to write for 15 minutes about a personal and emotional topic after which they were instructed to suppress thoughts about what they had written. A second group wrote about an emotional topic, but received no suppression instructions afterwards. In the third and fourth condition, participants wrote about a non-personal and neutral topic, with and without subsequent suppression instructions, respectively. Immunological markers served as dependent measures (e.g., the number of lymphocytes found in the participants' blood). Results indicated that there was only a marginal suppression effect ($p = .08$), but a significant main effect for writing content ($p = .03$), in that irrespective of suppression attempts, writing about self-relevant topics produced better health effects than writing about neutral topics. Thus, these results seem to indicate that expressive writing may overrule the detrimental effects of suppression. Likewise, in the Reynolds and Tarrier (1996) study, it was found that monitoring of traumatic intrusions had beneficial effects, even when it was accompanied by avoidant control strategies (e.g., thought suppression). The authors suggested that keeping a diary of intrusive recollections increases the amount of patients' perceived control over their thoughts. Perhaps, then, it is an increased sense of being in control rather than abstinence from thought suppression that constitutes the therapeutically active element in the studies referred to above. This may also explain why contrary to the predictions that flow from Wegner's work, some studies did find positive effects of thought stopping in the treatment of obsession (e.g., Kirk, 1983). However, in those studies, patients were first taught how to deliberately evoke obsessive thoughts. Only after they had mastered this, they were instructed to direct thought stopping techniques to any neutralising attempts that might occur as a reaction to the obsessions. Again, the crucial element might be a sense of control over traumatic intrusions.

Secondly, while it has become common wisdom that confronting and expressing painful thoughts and emotions is therapeutically effective, there are several research findings that invite a more balanced view on this issue. For example, dysphoric individuals who are instructed to ruminate about themselves and their feelings have been found to be more pessimistic and impaired in their problem solving capabilities than are dysphoric individuals who distract their attention from their moods (see, for a review, Lyubomirsky, Caldwell, & Nolen-Hoeksema, 1998). As another example, there are indications that unstructured exposure to trauma reminders might be harmful in the treatment of PTSD (e.g., Boudewyns & Hyer, 1990; Johnson, Rosenheck, Fontana, Lubin, Charney, & Southwick, 1996). On a related note, Solomon et al. (1992) found that treating PTSD veterans with prolonged exposure to military cues may result in exacerbation of PTSD symptoms. Commenting on these disappointing findings, Littrell (1998) concluded that confronting painful memories and thoughts will only yield benefit if the treatment also encourages

cognitive restructuring of the traumatic experiences. It is worth citing the final remarks of Littrell's (1998, p. 96) thoughtful review: "Revisiting painful emotion has the potential to improve health and psychological functioning. However, success is not explained by a purging/discharge mechanism or because the opposite of attending to emotion, viz., inhibition is precluded. Mere attention to feelings of distress can enhance distress. In order to preclude increasing distress as a consequence of revisiting trauma, some new response to the negative-emotion-eliciting stimulus (..) must be found".

Concluding remarks

The pioneering work of Wegner and colleagues (1987) on the paradoxical effects of thought suppression has stimulated a vast amount of research (see, for a review, Clark & Purdon, 1993). To date, more than 30 studies have documented immediate enhancement and/or rebound effects of thought suppression. Thus, it is safe to conclude that the paradoxical consequences of thought suppression represent robust phenomena. In contrast, the memory-out-of-order effect that is also ascribed to thought suppression (Wegner et al., 1996), is less well established. That is, a recent attempt to replicate this phenomenon with emotional target material yielded disappointing results (Rassin et al., 1997). Thus, parametric studies are needed to establish the boundary conditions of the memory-out-of-order effect of thought suppression (see below).

In literature, speculations about the involvement of thought suppression in psychopathology abound. These speculations often boil down to the idea that thought suppression contributes to the aetiology or maintenance of obsessions, anxiety symptoms, depressive moods, or addictions. This idea possesses face validity given the robustness of the paradoxical effects of thought suppression in the laboratory. It is worth citing again Wegner et al.'s (1987, p. 12) words: "The observed processes, though fairly tame in the laboratory, might conceivably create powerful mental preoccupations in natural settings". However, thought suppression studies that have been carried out in clinical samples do not support such a line of reasoning. Over the past few years, other theories about the origins of obsessions (e.g., Rachman, 1998a) and worrying (Dugas et al., 1998) have been formulated and tested with favourable results. In these well articulated accounts, thought suppression plays a relatively marginal role. Likewise, in the case of phobias and traumatic intrusions it is not at all clear whether thought suppression represents more than a symptomatic epiphenomenon. This is not to say that thought suppression manoeuvres in these disorders should be ignored, but rather that their causal significance might have been overstated.

The links between thought suppression, cognitive intrusions, and psychopathology warrant further study. For example, few studies have examined Rachman's (1981) proposal that depressive mood impairs the controllability of intrusive cognitions, while anxiety enhances the threatening nature of such cognitions. Meanwhile, further progress in this area will critically depend on two issues that both have to do with the taxonomy of the

basic phenomena involved. First, previous studies on thought suppression have generally adopted a broad definition of intrusive thinking. Worries, intrusive traumatic memories, anxious thoughts, and intrusive thoughts all have been treated as similar phenomena that may or may not become targets of thought suppression. While these manifestations of intrusive cognition share a number of features (e.g., Tallis & De Silva, 1992), they also differ in important respects. Germane to this issue is the work of Clark (1992; Clark & Claybourn, 1997) who found that one can distinguish between obsessive intrusions and negative automatic thoughts, with the former being more ego dystonic and unacceptable than the latter. Likewise, worries and obsessive intrusions differ in that worries have a more verbal character, are more oriented towards future threats, and are less involuntary (e.g., Clark & Claybourn, 1997; Wells & Morrison, 1994). Additionally, recent work of Brewin and co-workers (Brewin, Christodoulides, & Hutchinson, 1996; Reynolds & Brewin, 1998) shows that there are important differences between intrusive thoughts and intrusive memories, with the former occurring more often in PTSD patients, depressive patients, and even normal participants. Also, intrusive thought often contains elements such as reinterpretation or catastrophic elaboration. What is urgently needed, then, is a more accurate taxonomy of cognitive intrusions and the dimensions on which they vary. Such a taxonomy would enable researchers and clinicians to formulate more sophisticated hypotheses about the dynamics behind cognitive intrusions and the role played by thought suppression in these dynamics.

Secondly, it has become customary to think of thought suppression as a unitary phenomenon (Freeston, Ladouceur, Thibodeau, & Gagnon, 1991). At the same time, there is a large, but scattered literature on the various avoidance and escape oriented strategies that people may resort to when they are confronted with intrusive cognitions. These strategies have been labelled blunting (Miller, 1992), cognitive avoidance (Foa & Kozak, 1986), distraction (Baum, 1987), and retrieval inhibition (Bjork, 1989), to name but a few examples. To a certain extent, these concepts overlap with thought suppression, due to the fact that they all assume the existence of inhibitory mechanisms that deactivate mental representations. Note, however, that there are also marked differences between these concepts in whether or not a maladaptive (i.e., counterproductive) quality is ascribed to them. For example, Miller (1992) concluded that in medical contexts, people who typically avoid threat-relevant information ("blunters") are often less distressed in response to health threats than are individuals who monitor threat-relevant cues ("monitors"). There are even indications that during anticipation of a medical visit, monitors display a higher frequency of intrusive thoughts than do blunters. However, whether blunting is an adaptive strategy depends on an array of conditions (e.g., nature and type of medical intervention, short versus long-term consequences of blunting). Findings such as these demonstrate that this research domain would also profit from a refined taxonomy of avoidant strategies. One promising starting point for such an endeavour is the Thought Control Questionnaire (TCQ) developed by Wells and Davies (1994). The TCQ consists of 30 items

that were derived from a pool of avoidant strategies reported by anxiety disordered patients. More specifically, it covers 5 distinct manoeuvres, namely distraction (e.g., "I keep myself busy"), social coping (e.g., "I talk to a friend about the thought"), worrying (e.g., "I worry about more minor things instead"), self-punishment (e.g., "I shout at myself for having the thought"), and re-appraisal (e.g., "I try a different way of thinking about it"). It is highly unlikely that all these manoeuvres have counterproductive effects that contribute to the persistence of psychopathology (e.g., Warda & Bryant, 1998).

With these preliminary remarks in mind, we see several promising research avenues for future studies concerned with the links between thought suppression strategies and psychopathology. To begin with, it would be interesting to evaluate in a systematic fashion meta-cognitions about thought suppression strategies. Do people who engage in such strategies believe that the mere act of suppression proves that a certain target intrusion is less acceptable (e.g., Freeston et al., 1991)? Do they believe that certain thought suppression strategies are useful in helping to find solutions and preventing negative outcomes, as seems to be the case in pathological worrying (Dugas et al., 1998)? How do these meta-cognition beliefs about thought suppression relate to its counterproductive effects both within and outside the laboratory?

A second issue that warrants further study has to do with the complex interactions between mood, cognitive intrusions, cognitive coping strategies, and types of psychopathology. For example, some authors have found evidence to suggest that dysphoria reduces the acceptability of certain intrusions (e.g., Reynolds & Salkovskis, 1992). In this way, mood states may trigger thought suppression of the sort described by Wegner (i.e., active resistance) and this may give rise to obsessive ruminations (Freeston et al., 1991; Rachman, 1978). Alternatively, the intrusions could elicit morbid preoccupation (i.e., attentive thinking) of the type found in worriers (Rachman, 1978). Obviously, these complex interactions deserve further study.

A third issue pertains to the effects of thought suppression strategies on memory. As things stand, it is unlikely that thought suppression strategies may account for dissociative amnesia (cf., supra). However, it is perfectly possible that thought suppression strategies have an impact on the formal characteristics of autobiographical memories. Germane to this issue are studies concerned with the phenomenon of overgeneralised memories which refers to the difficulty that some patients have in retrieving specific autobiographical memories (Williams, 1992, 1996). Overgeneralised memories have been documented in patients with depression (e.g., Williams, 1992), patients with PTSD (e.g., McNally, Lasko, Macklin, & Pitman, 1995), and patients with OCD (e.g., Wilhelm, McNally, Baer, & Florin, 1997), but are not found in normal individuals scoring high on neuroticism or depression (Merckelbach, Muris, & Horselenberg, 1996). A recurring theme in studies exploring the origins of overgeneral memories is that these memories are tied to cognitive intrusions that occur against a background of depressive mood (e.g., Wilhelm et al., 1997; Kuyken & Brewin, 1995). Avoidance strategies directed at these intrusions could promote a general retrieval inhibition (Kuyken & Brewin,

1995) and/or could consume excessive cognitive capacity (Wilhelm et al., 1997). In either case, the result would be a relative inability to retrieve specific autobiographical memories. Perhaps, then, overgeneralised memories may become so extensive and profound that they are experienced as dissociative amnesia. So far, no study has looked specifically at the associations between intentional efforts to avoid distressing memories, overgeneralised memories, and dissociative amnesia. However, there is some indirect evidence suggesting that at least some persons who report periods of amnesia for traumatic events, in fact, refer to intentional avoidance of traumatic memories (Melchert & Parker, 1997). Germane to this issue is also a study by Davis and Schwartz (1987) who found that repressors recall fewer negative autobiographical memories than do controls (see, for a more detailed analysis, Mendolia, Moore, & Tesser, 1996). While such findings await replication, the co-occurrence of cognitive intrusions, depressive mood, avoidance strategies, and overgeneral memories seems to be well established and so, it provides a good starting point for further studies on the memory effects of thought suppression.

In sum, then, previous claims about the causal role of thought suppression in certain disorders have received little empirical support. Meanwhile, research on the pathogenic potential of thought suppression strategies has been hindered by a lack of detailed taxonomies of intrusive phenomena and avoidant strategies. To the extent that such taxonomies become available, more sophisticated hypotheses about the links between thought suppression strategies and psychopathology can be evaluated.

3

THOUGHT SUPPRESSION AND THE COGNITIVE THEORY OF OBSESSION

3.1 Introduction

In the cognitive theory of obsession, cognitive biases play a crucial role because they lead to a catastrophic interpretation of intrusive thoughts. Mineka and Sutton (1992) define cognitive biases, rather broadly, as "any selective or nonveridical processing of emotion-relevant information" (p. 65). In the literature, numerous cognitive biases with obsession provoking potential have been identified. Table 3.1.1 presents a number of examples of such biases. These examples are derived from Emmelkamp and Aardema (1999), Salkovskis (1985), and Salkovskis et al. (2000).

Table 3.1.1 Examples of cognitive biases relevant to the development of obsessive intrusions.

Having a thought about an action is morally equivalent to performing the action
If a thought comes to mind, this means that this thought is likely to come true
If a thought repeatedly comes to mind, this means that it must have special meaning
Failing to prevent harm is the same as having caused the harm in the first place
One can and should exercise control over one's thoughts
Responsibility is not attenuated by other factors (e.g., low probability of occurrence)
Not neutralising after an intrusion is the same as wanting the intrusive thought to come true
If I feel anxious, this means that I must be in danger
Intrusive thoughts unveil my real self

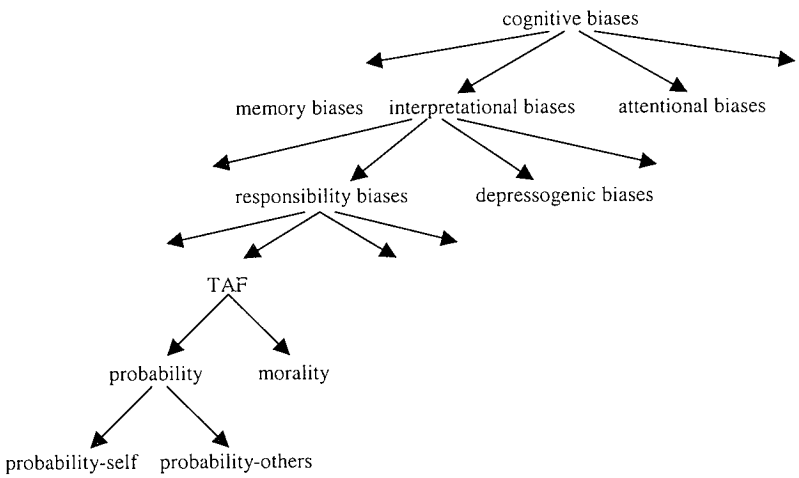
Since most of the cognitive biases relevant to obsessions imply an inflated sense of responsibility for one's own intrusions, they are referred to as responsibility biases. In the cognitive theory of obsession, responsibility is defined as "the belief that one has power which is pivotal to bring about or prevent subjectively crucial negative outcomes. These outcomes are perceived as essential to prevent. They may be actual, that is, having consequences in the real world, and/or at a moral level" (see Salkovskis, 1999, p. S32).

According to Rachman, Thordarson, Shafran, and Woody (1995), two responsibility biases appear to be specifically associated with obsessive-compulsive symptoms. First, the morality bias implies that thoughts (e.g., violent fantasies) are morally equivalent to overt behaviours (e.g., violent acts). Second, the probability or likelihood bias implies that the mere thought of a hypothetical situation (e.g., a loved one being involved in a car crash) increases the likelihood that this situation will actually occur. The probability bias can be subdivided, depending on whether the anticipated negative consequences pertain to oneself or to others. Since both biases share the notion that thoughts and actions are spuriously related, the morality and probability biases together are referred to as "thought-action fusion" (TAF; Shafran, Thordarson, & Rachman, 1996). Figure 3.1.1 provides a schematic overview of the position of TAF among other biases that have been hypothesised to operate in the aetiology of anxiety and mood disorders.

There are only a few experimental paradigms addressing responsibility in Obsessive-Compulsive Disorder (OCD). One way to manipulate responsibility is to place compulsive checkers in their natural environment and instruct them to carry out an action (e.g., locking the door) without subsequent checking. Responsibility can be decreased by explaining that the therapist/researcher has complete responsibility for unfortunate consequences, if any. On the other

hand, feelings of responsibility increase if the therapist tells the participant that the participant is fully responsible. With this experimental paradigm, increased responsibility has, indeed, been found to result in discomfort, increased perceived probability of threat, and urge to neutralise (Lopatka & Rachman, 1995; Shafran, 1997). Ladouceur et al. (1995) used a different paradigm to manipulate responsibility. These authors asked participants to sort 200 pills by colour (there were 10 different colours). Participants in the low responsibility condition were told that this was nothing more than a colour perception task. Those in the high responsibility condition were told that the experiment sought to investigate whether the used colours are easy to distinguish. The pills were to be exported to an Asian country as a medication for a virus. The colours would serve as a means of identification for the different pills. Thus, it was very important that participants tried their utmost to correctly sort the pills. With this paradigm, high responsibility resulted in a preoccupation with errors, checking, and hesitating. Lastly, Rachman, Shafran, Mitchell, Trant, and Teachman (1996) looked at the effects of TAF. More specifically, these authors selected participants who suffered from a TAF-tendency and instated an intrusion by instructing participants to insert the name of a loved one into the written sentence "I hope ... is in a car accident". Evidently, this procedure resulted in strong increases in feelings of discomfort, guilt, responsibility, anxiety, and urges to neutralise.

Figure 3.1.1 *Position of TAF among other biases.*



Chapter outline

The studies presented in this chapter sought to combine the thought suppression paradigm with insights from the cognitive theory of obsession. The first study (3.2) pertains to the question of whether thought suppression is associated with compulsions. Wegner and Zanakos (1994) found that "thought suppression was not particularly useful as a predictor of clinical indicators of compulsion, ... suggesting that suppression is tied more to subsequent cognitive effects than to

behavioural ones" (p. 634). In the current study, the association between thought suppression and compulsions was explored by using the White Bear Suppression Inventory (WBSI; Wegner & Zanakos, 1994) and a questionnaire about daily "rituals". This topic is of relevance to the cognitive theory of obsession, because, according to this theory, the increased number of intrusions due to suppression attempts may lead to the use of other coping strategies such as neutralising compulsions. Alternatively, people may not only suppress intrusions, but also the urge to engage in compulsive behaviour, which may paradoxically result in strengthening of such urge.

The remaining three studies explored the associations between thought suppression and TAF (representing responsibility biases). First, a new experimental analysis of TAF (more specifically, probability bias) is presented (3.3). Participants in this study were brought to believe that the EEG apparatus to which they were connected was able to read their mind, in that it was sensitive enough to detect any thoughts of the word "apple". Half of the participants were, furthermore, told that any thoughts of the word apple might result in the administration of an electrical shock to a peer participant. Thus, the effects of the increased significance attached to the target thought (due to the instructions) were examined. Taking a structural equation modelling approach, the following study (3.4) pertains to the interactions between TAF and thought suppression. In this study, a sample of undergraduate students was asked to complete questionnaires pertaining to TAF, thought suppression, and obsessional problems. Paragraph 3.5 describes a longitudinal study concerned with the extent to which TAF and thought suppression tendencies can be changed during psychotherapy. This study relied on a mixed clinical sample consisting of OCD patients and patients with other anxiety disorders. In the final paragraph (3.6), the main findings of the various studies are summarised and discussed.

3.2 Suppression and ritualistic behaviour in normal participants

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Abstract

Previous research has shown that normal and abnormal ritualistic behaviours do not differ in content. Rather, the differences between both categories of rituals pertain to characteristics like frequency, intensity, discomfort, and resistance. This study sought to investigate whether thought suppression is linked to these characteristics. Questionnaires on thought suppression and rituals were administered to a sample of undergraduate students (N = 166). Habitual suppressors (n = 20) and non-suppressors (n = 20), as measured by the White Bear Suppression Inventory (WBSI), were selected and compared with regard to the characteristics of their rituals. Suppressors experienced their rituals as more intense, discomforting, and resistance provoking than did non-suppressors. There were no group differences in the content, frequency, and perceived senselessness of rituals. While the cross-sectional nature of the present study precludes causal inferences, its findings are consistent with the view that chronic thought suppression may promote ritualistic behaviour. Clearly, the details of the link between thought suppression and rituals need further examination.

[1] Acknowledgement. The authors thank Anne Roefs for her assistance in processing the data, and three reviewers for their useful comments on an earlier draft.

Compulsions as occurring in Obsessive-Compulsive Disorder (OCD) are repetitive and stereotypical behaviours. Although patients suffering from compulsions do not recognise an immediate purpose for this behaviour, they do feel the urge to carry out their rituals. Rachman (1998b, p. 121) speaks of compulsions as being "in many ways the purest example of abnormal behaviour". While this suggests that compulsions show little or no similarities with normal behaviour, there are several reasons to doubt that compulsive behaviour strongly deviates from normal ritualistic behaviour. First, recent studies show that generally accepted rituals are rather similar to pathological compulsions (e.g., Dulaney & Fiske, 1994; Fiske & Haslam, 1997). In these studies, descriptions of pathological compulsions and normal rituals were given to blind judges, who were asked to differentiate between the two categories of behaviour. The judges regularly misclassified normal rituals as abnormal compulsions, which led the authors to conclude that there is a "remarkable detailed phenomenological resemblance between OCD and culturally meaningful rituals" (Fiske & Haslam, 1997, p. 220). Fiske and Haslam (1997) argue that the parallels between normal and abnormal rituals originate from their common goal, namely structuring the environment. In their words: "... cultural rituals and OCD are characterised by a desire to produce order, regularity, boundaries, and clearly demarcated categories" (Fiske & Haslam, 1997, p. 221). The similarities and differences between "normal" and "abnormal" rituals were recently studied by Muris, Merckelbach, and Clavan (1997). These authors asked 150 undergraduate students about their rituals. A slight majority (i.e., 54,7%) reported to have distinct rituals. These participants were then asked to provide detailed descriptions of their rituals. Furthermore, they were invited to answer questions about the formal characteristics of their rituals (frequency, intensity, and so on). Similar information was obtained from the records of OCD patients who received treatment in an outpatient facility. Thus, descriptions of normal and abnormal rituals were gathered. Next, expert judges were given these two categories of descriptions and were asked to discriminate between normal and abnormal rituals. It was found that judges were rather unsuccessful in differentiating between the two kinds of rituals when they had to rely on descriptions of the content of the rituals. Apparently, everyday and pathological rituals do not differ in content. However, formal characteristics enabled the judges to successfully discriminate between normal and abnormal rituals. That is, OCD patients experienced their rituals as being more frequent, intense, discomforting, and resistance eliciting than did controls.

A second reason to doubt that there is a clear demarcation between normal and abnormal rituals has to do with the fact that compulsive behaviour is often related to obsessive thinking. Since the study by Rachman and De Silva (1978), it is widely accepted that normal and abnormal obsessions do not differ in terms of their content (see also Salkovskis & Harrison, 1984). Again, differences between these two categories pertain to characteristics such as frequency, intensity, discomfort, and resistance. One could argue that if obsessions constitute a continuum that encompasses both normal and abnormal obsessions, much the same may be true for normal and abnormal rituals.

If normal and abnormal rituals refer to the ends of a single continuum, the question arises how normal rituals can become pathological compulsions. In the case of obsessions, it has been argued that thought suppression (trying not to think about the obsessive thought) generally has counterproductive effects. By this view, suppression makes the unwanted thought emerge more often, and more intensely, which in turn will make it more discomforting (Wegner, 1989). Applying a similar line of reasoning to compulsions, one could argue that thought suppression may contribute to the development of pathological rituals. That is, individuals who tend to suppress thoughts about their rituals may consequently suffer from more frequent and intense urges to engage in their ritualistic behaviour. The present study investigated whether individuals who report a tendency to suppress thoughts do, indeed, experience their rituals differently from individuals who do not report such a tendency.

Method

Undergraduate psychology students (N = 166; 52 males; mean age = 19.7 years; SD = 3.3; range: 17-39 years) completed Dutch versions of the White Bear Suppression Inventory (WBSI; Wegner & Zanakos, 1994; Muris, Merckelbach, & Horselenberg, 1996), the Symptoms Checklist (SCL-90; Derogatis, 1977), and a short questionnaire about rituals that was developed for the purpose of the present study. The WBSI (α = .88) contains 15 items (e.g., "I wish I could stop thinking of certain things") that tap the habitual tendency to suppress (unpleasant) thoughts. Items are scored on a 5-pointscale (1 = *strongly disagree*; 5 = *strongly agree*). A total score (range: 15-75) can be calculated by summing the items. The higher the score, the stronger the tendency to suppress. Note that it has been argued that some of the WBSI items pertain to loss of mental control and not to thought suppression per se (e.g., "I have thoughts that I can not stop"; see Muris, et al., 1996). WBSI scores can be corrected for the loss-of-control component by removing 5 items. In the present study, this corrected WBSI score (α = .83) was used [2]. Consequently, the total scores ranged from 10 to 50. The SCL-90 (α = .96) contains 90 items that address various psychopathological symptoms such as obsessive-compulsive (9 items), anxiety (10 items), and depression (16 items) symptoms. SCL-90 items are scored on 5-pointscales (1 = *not at all*; 5 = *a lot*). For the purpose of the present study, the obsessive-compulsive, anxiety, and depression subscales were used (αs: .78, .88, and .90, respectively). The questionnaire about rituals began with an item asking whether the respondent performed distinct rituals. If so, (s)he was invited to give a brief description of his or her most important ritual. The respondent was further asked a set of 7 questions that pertained to the characteristics of this ritual. These questions were derived from the Muris et al. (1997) study on the differences between normal and abnormal rituals. More specifically, respondents were asked how frequently they engaged in their ritualistic behaviour (1 = *never*; 6 = *several times a day*), whether or not the

[2] Analyses were also carried out with uncorrected WBSI scores, but, basically, this yielded similar results.

ritual was usually carried out in response to a thought (*yes/no*), how intense the urge to perform such behaviour generally was (1 = *not at all*; 6 = *very intense*), whether the ritual invoked feelings of discomfort (1 = *not at all*; 6 = *a lot of discomfort*), to what extent the ritual was perceived as senseless (1 = *not at all senseless*; 5 = *completely senseless*), to what extent the respondents made attempts to resist the urge to engage in their ritual (1 = *I never try to resist*; 5 = *I always try to resist*), and how successful these attempt to resist generally were (1 = *completely unsuccessful*; 5 = *completely successful*).

Ninety-nine out of 166 respondents (59%) reported to have rituals. From this subsample, 20 participants with the highest (corrected) WBSI scores (> 37) and 20 participants with the lowest scores (< 22) were selected. Mean age of this subsample (15 males) was 19.8 years (*SD* = 3.6; range: 18-38 years). Suppressors (high WBSI scores) and non-suppressors (low WBSI scores) were compared with regard to the characteristics of their rituals. The two groups did not differ with respect to age ($t[38] < 1.0$) or sex ($\chi^2 = 2.7$, $p = .10$).

Results

In the sample of 99 respondents who indicated to have a clear ritual, checking behaviour (e.g., keys and doors) was by far the most commonly reported ritual (i.e., 58%) [3]. Magical protective acts (e.g., touching wood) accounted for 19% of the rituals. Washing, cleaning, and ordering (11%) constituted a third category. Avoidance behaviour (e.g., trying not to step on certain pavements) was reported by 6% of the respondents. Five respondents reported rituals (e.g., swallowing) that were difficult to assign to one of these four categories. A Chi-square analysis revealed that there were no differences in types of rituals reported by suppressors and non-suppressors ($\chi^2 = 2.5$, $p = .64$).

Figure 3.2.1 shows mean scores of suppressors and non-suppressors on the various ritual dimensions [4]. Suppressors and non-suppressors did not differ in the self-reported frequency of rituals, mean scores being 5.1 (*SD* = 1.2) and 4.7 (*SD* = 1.5), respectively: $t(37) = -1.3$, $p = .17$. The two groups did not differ in the extent to which rituals occurred as responses to internal events. That is, 8 suppressors and 5 non-suppressors reported that their ritualistic behaviour generally occurred as a reaction to a specific thought: $\chi^2 = 1.0$, $p = .31$. Suppressors found the urge to engage in their rituals more intense (*M* = 3.4; *SD* = 1.2) than did non-suppressors (*M* = 2.7; *SD* = 1.1): $t(38) = -2.2$, $p = .02$. Furthermore, suppressors experienced more discomfort due to their rituals, as compared to non-suppressors: 3.1 (*SD* = 1.1) and 2.4 (*SD* = .9), respectively: $t(38) = -2.2$, $p = .02$. Both groups did not differ in the extent to which they experienced their ritual as senseless, mean scores being 3.2 (*SD* = 1.6) for suppressors and 2.6 (*SD* = 1.5) for non-suppressors: $t(38) = -1.2$, $p = .11$. Suppressors more often resisted their urge to engage in ritualistic behaviour than did non-suppressors, mean scores being 2.4 (*SD* = 1.1) and 1.7 (*SD* = .9), respectively ($t[38] = -2.2$, $p = .02$). Yet, there was no difference between the

[3] These categories were adopted from Muris et al. (1997).

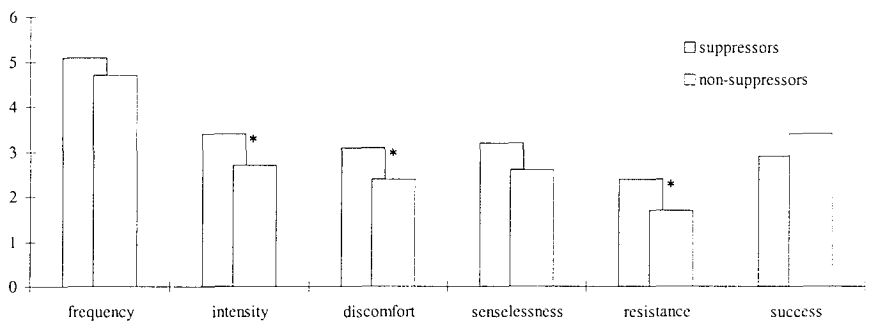
[4] The item referring to antecedent thoughts was excluded from figure 3.2.1, since that item had a *yes/no* answer format.

two groups with respect to the successfulness of these attempts to resist rituals. Mean scores for suppressors and non-suppressors were 2.9 (SD = 1.3) and 3.4 (SD = 1.2), respectively: $t(38) = 1.1$, $p = .13$.

Both groups differed in their scores on the SCL-90 subscales. For the obsessive-compulsive symptoms scale, mean score for suppressors was 16.9 (SD = 5.7) and for non-suppressors 14.0 (SD = 3.5): $t(37) = -1.9$, $p = .04$. Suppressors' mean score on the anxiety scale was 17.4 (SD = 6.7), while non-suppressors had an average score of 11.4 (SD = 1.5): $t(38) = -3.9$, $p < .01$. Mean scores on the depression scale were 26.3 (SD = 8.8) and 20.5 (SD = 5.3) for suppressors and non-suppressors, respectively: $t(37) = -2.5$, $p = .01$.

To explore how strongly thought suppression was related to the reported characteristics of rituals, corrected WBSI scores and scores on the three SCL-90 subscales were entered as predictors in a hierarchical regression analysis with ritual characteristics as dependent variables. In the regression analysis, all participants who reported to have distinct rituals were included (N = 99). Table 3.2.1 presents the correlations between the WBSI and the dependent variables after obsessive-compulsive symptoms, anxiety, and depression were partialled out. These partial WBSI correlations were obtained by first entering the SCL-90 subscales and then entering the WBSI. For the partial correlations between the dependent variables and the SCL-90 subscales (presented in Table 3.2.2), the reversed procedure was followed. That is, the OCD, anxiety, and depression scales were entered after the corrected WBSI scores had been entered. As can be seen in Table 3.2.1, the WBSI explained additional variance in intensity, discomfort, resistance, and successfulness of resistance after the OCD, anxiety, and depression scales had been entered. However, it should be noted that the observed correlations were small.

Figure 3.2.1 *Mean scores of suppressors (n = 20) and non-suppressors (n = 20) on frequency, intensity, discomfort, senselessness, resistance, and successfulness of resistance attempts.*



Note. ** $p < .05$ (one-tailed).*

Table 3.2.1 Partial correlations between the WBSI and the reported characteristics of rituals after correction for OCD, anxiety, depression, and these three symptom-clusters together (N = 99).

	Frequency	Intensity	Discomfort	Senselessness	Resistance	Success
WBSI corrected for OCD	.09	.20 *	.19 *	.06	.19 *	-.20 *
WBSI corrected for anxiety	.11	.15	.17 *	.03	.15	-.19 *
WBSI corrected for depression	.15	.21 *	.17 *	.03	.17 *	-.23 *
WBSI corrected for OCD, anxiety, and depression	.06	.18 *	.17 *	.06	.19 *	-.21 *

Note. WBSI = White Bear Suppression Inventory; OCD = Obsessive-Compulsive Disorder; OCD, anxiety, and depression refer to the scales of the Symptoms Checklist (SCL-90).
** p < .05 (one-tailed).*

Table 3.2.2 Partial correlations between the SCL-90 OCD, anxiety, and depression scales and the reported characteristics of rituals after correction for the WBSI (N = 99).

	Frequency	Intensity	Discomfort	Senselessness	Resistance	Success
OCD	.16	.23 *	.18 *	.01	.12	.06
Anxiety	.13	.22 *	.11	-.01	.07	.01
Depression	.04	.13	.21 *	.12	.12	.16

Note. WBSI = White Bear Suppression Inventory; OCD = Obsessive-Compulsive Disorder; OCD, anxiety, and depression refer to the scales of the Symptoms Checklist (SCL-90).
** p < .05 (one-tailed).*

Discussion

The results of the present study can be summarised as follows. To begin with, as was the case in previous research (Muris et al., 1997), more than 50% of our undergraduate sample appeared to engage in some kind of ritualistic behaviour on a regular basis. Checking behaviour was the most prevalent ritual. Second, respondents scoring high on the WBSI (suppressors) experienced their rituals differently from low scoring participants (non-suppressors) in that suppressors evaluated their rituals more like patients suffering from OCD. Although suppressors did not display their rituals more frequently, they experienced them as being more intense and more discomforting, compared to non-suppressors. Suppression was not linked to senselessness of rituals. Suppressors were more eager to resist their rituals than non-suppressors, but individuals in both groups were equally (un)successful at these attempts to resist their rituals. Hierarchical regression analysis revealed that thought suppression was related to intensity, discomfort, resistance, and successfulness of resistance after obsessive-compulsive, anxiety, and depressive symptoms as measured by the SCL-90 had been partialled out.

The current findings are in line with the hypothesis that thought suppression intensifies rituals. Research has shown that thought suppression directed at intrusions produces paradoxical effects such that the intrusions occur with a heightened frequency and are consequently experienced as more intense and discomforting (Wegner, 1989). The current results suggest that a similar

mechanism may operate in the case of rituals. However, the precise details of the connection between suppression and rituals deserve further study. Note that the present results are silent about what exactly is suppressed in the case of rituals. For example, individuals may suppress the urge to engage in their rituals which could strengthen this urge. Alternatively, thoughts about the ritual may become the target of suppression attempts. Due to the paradoxical effects of suppression, such thoughts may then become more intense. A third possibility is suggested by the idea that rituals may be conceptualised as reactions to obsessive thoughts (e.g., Rachman, Shafran, Mitchell, Trant, & Teachman, 1996; Salkovskis, 1989). By this view, rituals have the instrumental function of reducing tension and anxiety caused by intrusions. Thus, it may well be that suppression promotes intense intrusions which, in turn, produce a stronger urge to engage in (neutralising) rituals. The measures used in this study are not sensitive enough to differentiate between these three possibilities. That is, the WBSI does not ask what kind of thoughts (e.g., disturbing thoughts or thoughts about rituals) the respondent tends to suppress. Furthermore, it should be noted that the cross-sectional nature of the present study precludes firm conclusions about causality. Therefore, future studies are needed to examine the precise link between thought suppression and intense rituals.

3.3 Thought-action fusion as a causal factor in the development of intrusions

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Behaviour Research and Therapy, 1999, *37*, 231-237

Abstract

Thought-action fusion refers to the tendency to treat thoughts and actions as equivalents. Some authors (e.g., Rachman, 1997; *Behaviour Research and Therapy*, *35*, 793-802) have suggested that thought-action fusion plays a role in the aetiology of obsessive intrusions. The present study sought to test this idea. Participants (n = 19) in the experimental condition underwent a bogus EEG recording session. They were informed that the apparatus was able to pick up the word "apple" and that thoughts of that word could result in the administration of electrical shocks to another person. After having spent 15 minutes in the EEG laboratory, experimental participants and controls (n = 26) completed a short questionnaire containing items about characteristics of the target thought (e.g., frequency, aversiveness). Results indicate that thought-action fusion, indeed, promotes intrusive thinking in that it results in a higher frequency of target thoughts, more discomfort, and more resistance. Thus, the current findings support the idea that thought-action fusion may contribute to the development of obsessive intrusions.

Some people suffer more from intrusive thoughts than others, and one reason for this may be that they interpret their intrusions in a different way. Both Salkovskis (1985) and Rachman (1993, 1997) have argued that people who feel responsible for their intrusions will experience more discomfort whenever unpleasant intrusive thoughts occur than people who do not feel responsible for their intrusions. By this view, people with an inflated sense of responsibility would be more at risk of developing a clinical obsession. Shafran, Thordarson, and Rachman (1996) introduced the concept of "thought-action fusion" (TAF) as a possible cause for an increased sense of responsibility. TAF refers to the tendency to assume incorrect causal relationships between one's own thoughts and external reality. For example, people may believe that thinking of a hypothetical situation will increase the probability that that situation actually occurs. This aspect of TAF is referred to as "TAF-likelihood". A second aspect of TAF is termed "TAF-morality" and pertains to the belief that unacceptable thoughts are morally equivalent to overt actions. Shafran et al. (1996) developed a questionnaire that intends to tap both aspects of TAF. This self-report TAF-scale contains items like "If I think of a friend falling ill this increases the risk that he will fall ill", and "Having violent thoughts is almost as unacceptable to me as violent acts". Clearly, people who engage in one or both forms of TAF will experience an inflated sense of responsibility for their intrusions. In this way, TAF may promote the frequency and aversiveness of intrusions. In more general terms, it may play a role in the transformation of normal into abnormal obsessions as they occur in Obsessive-Compulsive Disorder (OCD; see Rachman & De Silva, 1978).

There is experimental evidence to suggest that an inflated sense of responsibility may contribute to obsessive behaviour. In a series of studies, Ladouceur et al. (1995) manipulated perceived responsibility and then examined its effects on checking. Results showed that inflated responsibility, indeed, leads to an increased frequency of checking behaviour. In a clinical study, Lopatka and Rachman (1995) found further support for the particular significance of perceived responsibility in compulsive checking behaviour. So far, no study has directly examined whether TAF may act as an antecedent of inflated responsibility. While there is correlational evidence showing a robust connection between scores on the TAF-scale and obsessive-compulsive symptoms (Shafran et al., 1996), the precise causal relationships between TAF, responsibility, and obsessive intrusions are largely unknown. In the present study, an attempt was made to investigate the effects of experimentally induced TAF in normal participants.

Method

Participants

Forty-five healthy volunteers (30 women) participated in the experiment. Their mean age was 17.2 years (SD = 1.1; range: 16-20). Participants were recruited through advertisements in local newspapers. Psychology or medical students were excluded from the experiment. Most participants were high school students. Participants were assigned to the experimental (n = 19) or control (n =

26) condition (see below). All participants received a small financial compensation after completion of the experiment.

Procedure

Upon arrival at the laboratory, participants completed several questionnaires (see below). Participants in the experimental group then received the following written instructions: "During the next 15 minutes you should try to relax and sit quietly. As you may know, the process of thinking is accompanied by electrical activity in the brain. Therefore, it is possible to read thoughts by monitoring the electrical activity in the brain and we have an EEG apparatus which is very good in this respect. In this study, we want to document that our equipment is sensitive enough to "read" simple thoughts like "apple". Two electrodes will be placed on your head. This study is combined with another one. You should know that each time you think of "apple", the apparatus will pick up the thought and send a signal to the adjacent room where it is transformed into an electrical shock applied to the other participant you just met. He is participating in an experiment in which he is exposed to unpredictable shocks. The shocks do not cause any damage, of course, but are unpleasant. Note that the system does not function perfectly. That is, on some occasions, it may be that your thought of "apple" is not followed by an electrical shock. Finally, if you feel uncomfortable because the other participant receives a shock, you may interrupt the signal by pressing the button in front of you within two seconds after the word "apple" has surfaced in your stream of consciousness. Note that you are not obligated to do so. Also, you are not obligated to think of "apple"."

Before experimental participants received these instructions, they had met the second participant who was in fact a co-worker of the first author. After they had read the instructions, two bogus electrodes were attached to the participants' forehead. During the fifteen minutes that followed, the number of times that the "signal-interrupting" button was pressed was monitored. Of course, no EEG activity was recorded and no shocks were administered.

Participants in the control group were given the following written instructions: "During the next 15 minutes you should try to relax and sit quietly. As you may know, the process of thinking is accompanied by electrical activity in the brain. Therefore, it is possible to read thoughts by monitoring the electrical activity in the brain and we have an EEG apparatus which is very good in this respect. In this study, we want to document that our equipment is sensitive enough to "read" simple thoughts. Two electrodes will be placed on your head. You may think of anything, for example the word "apple"."

Materials

Before the experiment proper, participants completed the following questionnaires: the Maudsley Obsessional-Compulsive Inventory (MOCI; Hodgson & Rachman, 1977), the Social Desirability Scale (SDS; based on Crowne & Marlowe, 1964), the Thought-Action Fusion scale (TAF-scale; Shafran et al., 1996), and the White Bear Suppression Inventory (WBSI; Wegner & Zanakos, 1994).

The MOCI contains 30 *true/false* items about various obsessive-compulsive phenomena (e.g., "I avoid using public telephones because of possible

contamination"). Total scores range from 0 to 30, with higher scores indicating higher levels of OCD symptomatology.

The SDS contains 33 *true/false* statements (e.g., "I never hesitate to help someone in need"). Total scores vary from 0 to 33, with higher scores reflecting a stronger tendency to behave in a socially desirable way.

The TAF-scale contains 19 items that are answered on a 5-pointscale (0 = *strongly disagree*; 4 = *strongly agree*). Twelve items pertain to the morality component, while 7 items tap the likelihood aspect of TAF. Both subscales can be combined into a total score, ranging from 0 to 76.

The WBSI is a 15-items self-report scale measuring the tendency to suppress unwanted thoughts (e.g., "I wish I could stop thinking certain things"). Items are rated on a 5-pointscale (1 = *strongly disagree*; 5 = *strongly agree*). Thus, total scores range from 15 to 75, with higher scores indicating a stronger tendency to avoid unwanted intrusions.

After the experiment, participants completed a short questionnaire that was constructed for the purpose of the present study. Items were derived from Rachman's (1997) description of typical TAF-intrusions. This questionnaire contained 5 items that were answered by all participants, plus 2 additional items for participants in the experimental condition. Items had to do with the frequency with which the word "apple" had intruded consciousness during the 15-minute recording period (open-ended question), the degree of discomfort experienced while thinking of "apple", and changes in the subjective evaluation of the word "apple". Furthermore, participants were asked whether they had tried to avoid thoughts of "apple" and to what extent they got angry with themselves whenever thinking of "apple". The two items that were only answered by the experimental group asked whether participants had felt responsible and guilty about the other participant receiving electrical shocks. Except for the first one, all questions were answered using Visual Analogue Scales (VASs) ranging from 1 (*not at all*) to 100 (*very much*).

Results

Answers of experimental and control participants on the post-experimental questionnaire were compared with one-tailed *t*-tests. As 5 *t*-tests were conducted, a Bonferroni-correction was applied so that alpha was reduced from .05 to .01. Table 3.3.1 summarises the results of the *t*-test comparisons. As can be seen, experimental participants scored consistently higher on the items than did control participants. Thus, compared to the control condition, the TAF-manipulation resulted in more intrusions, more discomfort, more anger, more resistance, and a greater evaluative change of the target thought.

Items that were only answered by the experimental participants revealed that they had felt fairly responsible (M = 47; SD = 34.2) and guilty (M = 47; SD = 25.7). The mean number of "signal-interrupting" button pressing was 5.2 times (SD = 11.8). This frequency was correlated with the number of intrusions that was reported post-experimentally: $r = .94, p < .01$.

To test the predictive validity of the TAF-scale, Pearson correlations were computed between TAF scores, MOCI scores, and scores on the post-

experimental questionnaire. The mean scores on the TAF-scale and the MOCI were 21.3 (SD = 11.1) and 6.7 (SD = 5.0), respectively. TAF scores were neither correlated with MOCI levels, nor with scores on the post-experimental items. There was a significant, but modest correlation between the TAF-likelihood subscale and the total MOCI score: $r = .35$, $p < .05$.

Further inspection of the correlations among questionnaires revealed that WBSI scores (M = 47.5, SD = 10.4) were not correlated with MOCI scores or any of the post-experimental items. Yet, SDS scores (M = 14.6, SD = 4.7) were found to be negatively associated with responsibility and guilt items: r = -.68 and r = -.54, respectively (both $ps < .05$). This indicates that high levels of social desirability were related to low scores on responsibility and guilt.

Table 3.3.1 *Mean scores (and standard deviations) of experimental (n = 19) and control (n = 26) participants on the post-experimental questionnaire.*

Item	Experimental group	Control group	*t*-value	*p*-value
Number of intrusions	11.6 (13.4)	2.7 (3.9)	-2.8	.006
Discomfort	46.8 (32.4)	12.4 (16.6)	-4.2	< .001
Change of evaluation	42.4 (30.0)	14.0 (19.9)	-3.6	< .001
Efforts to avoid thinking	59.2 (31.8)	20.2 (22.9)	-4.6	< .001
Internally directed anger	32.0 (26.2)	10.6 (13.0)	-3.3	.002

Note. *The first item (number of intrusions) was open-ended; the remaining items were answered using a VAS-format (0 = not at all; 100 = very much).*

Discussion

In his recent review about responsibility, TAF, and intrusions, Rachman (1997, p. 800) writes: "The most pressing need is to test the core of the theory. Is it correct that obsessions are caused by the misinterpretation of the significance of one's intrusive thoughts? Will deliberate manipulations of the significance given to thoughts confirm the predicted increase/decrease in obsessions?". The current study attempted to influence the significance of intrusions by manipulating TAF. By and large, the results are in line with predictions that flow from hypotheses about the connection between TAF and obsessive intrusions (e.g., Shafran et al., 1996). That is, experimentally induced TAF resulted in more intrusions, more discomfort, and more resistance. As well, TAF led participants to engage in neutralising behaviour in about 50% of the intrusions. Taken together, these findings demonstrate that, in principle, TAF may contribute to the transformation of normal intrusions into obsessive intrusions. While previous studies indicate that experimentally manipulated responsibility influences anxiety and the urge to display checking behaviour (e.g., Ladouceur et al., 1995; Shafran, 1997), none of them have looked at TAF as one possible source of an inflated sense of responsibility. This may have to do with the difficulty of inducing TAF. That is, it is difficult to convince healthy undergraduates that their thoughts are equivalents of overt actions. For that reason, the present study relied on relatively naïve high school students rather than psychology or medical students.

Some remarks are in order as to why the word "apple" was used as a target thought. One could argue that in order to study TAF, the target thought should

have been that of, say, administering electrical shocks to someone. For several reasons this strategy was not followed. To begin with, having thoughts about electrical shocks is by definition unpleasant and this may overshadow TAF effects. Such ceiling effect is unlikely to occur with a neutral stimulus like "apple". A second reason for not using thoughts about electrical shocks as target intrusions was that the instruction might have been perceived as unethical.

The absence of significant correlations between the various questionnaires is surprising. Based on previous research (e.g., Shafran et al., 1996; Muris, Merckelbach, & Horselenberg, 1996), robust correlations between TAF-scale and WBSI, on the one hand, and MOCI, on the other hand, were anticipated. The absence of significant associations may be due to the relatively small sample size. Despite the small sample size, significant correlations did appear between SDS and post-experimental items on responsibility and guilt. The most plausible interpretation of these correlations is that people who tend to answer in a socially desirable way are reluctant to report feelings of responsibility and guilt. Perhaps, then, if social desirability tendencies are not present, a TAF manipulation would result in even higher scores on post-experimental responsibility and guilt items.

To some extent, the effects of the experimentally induced TAF resemble those of the thought suppression paradigm of Wegner and collaborators (Wegner, Schneider, Carter, & White, 1987). Wegner (1989) argued that suppressing an unwanted intrusion often results in more intrusions and, consequently, more discomfort. According to Wegner, this so-called "white bear" phenomenon may contribute to the development of clinical obsessions. While there is evidence to support this view (e.g., Rassin, Merckelbach, & Muris, in press), Wegner's hypothesis is silent about the antecedents of suppression. It may well be the case that TAF is such an antecedent. If future studies find further support for the involvement of TAF in the aetiology of clinical obsessions, this would have important clinical ramifications. While TAF is a cognitive bias that promotes the overinterpretation of intrusive thoughts, it may be sensitive to corrective interventions. In Rachman's (1997, p. 799) words: "It follows from the theory that the most direct and satisfactory treatment of obsessions is to assist patients in the modification of the putatively causal catastrophic misinterpretations of the significance of their intrusive thoughts. Bluntly, if these misinterpretations are corrected, the obsession should cease".

3.4 Relationships between thought-action fusion, thought suppression, and obsessive-compulsive symptoms: A structural equation modelling approach

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Abstract

Research has shown that there are strong similarities in content between the obsessions and compulsions that characterise Obsessive-Compulsive Disorder and non-clinical obsessions and compulsions. However, clinical and non-clinical obsessions and compulsions do differ with respect to characteristics like frequency, intensity, discomfort, and elicited resistance. Two separate concepts have been invoked to explain how normal obsessions and compulsions may develop into clinical phenomena. First, it is suggested that thought-action fusion (TAF) contributes to obsessive-compulsive symptoms. Second, thought suppression may intensify obsessive-compulsive symptoms due to its paradoxical effect on intrusive thoughts. Although both phenomena have been found to contribute to obsessive-compulsive symptoms, possible interactions between these two have never been investigated. The current study explored how TAF and thought suppression interact in the development of obsessive-compulsive symptoms. Undergraduate psychology students (N = 173) completed questionnaires pertaining to TAF, thought suppression, and obsessive-compulsive symptoms. Covariances between the scores on these questionnaires were analysed by means of structural equation modelling. Results suggest that TAF triggers thought suppression, while thought suppression, in turn, promotes obsessive-compulsive symptoms.

Obsessions and compulsions are the core features of Obsessive-Compulsive Disorder (OCD). According to the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV; American Psychiatric Association [APA], 1994, p. 418), "obsessions are persistent ideas, thoughts, impulses, or images that are experienced as intrusive and inappropriate and that cause marked anxiety or distress". Most obsessions involve thoughts about contamination, repeated doubts, a need to have things in a particular order, aggressive impulses, or sexual imagery (Rachman & Hodgson, 1980). DSM-IV defines compulsions as "repetitive behaviors (e.g., hand washing, ordering, checking) or mental acts (e.g., praying, counting, repeating words silently) the goal of which is to prevent or reduce anxiety or distress, not to provide pleasure or gratification. In most cases, the person feels driven to perform the compulsion to reduce the distress that accompanies an obsession or to prevent some dreaded event or situation" (APA, 1994, p. 418). The most common compulsions involve cleaning and checking (Rachman & Hodgson, 1980).

There is evidence to suggest that a majority of people experiences unpleasant intrusions similar to the obsessions seen in OCD. For example, Rachman and De Silva (1978; see also Salkovskis & Harrison, 1984) examined obsessive thinking in non-clinical individuals and OCD patients. These authors noted that about 80% of the non-clinical participants experienced obsessions. Furthermore, they found remarkable similarities between "abnormal" and "normal" obsessions as far as the content of these obsessions is concerned. However, abnormal obsessions were found to be more frequent, intense, of longer duration, and to produce more discomfort than normal obsessions. Muris, Merckelbach, and Clavan (1997) compared compulsive behaviours of OCD patients with rituals of normal participants. In accordance with the studies on abnormal and normal obsessions, these authors found a close correspondence between the content of abnormal and normal compulsions. Again, however, abnormal compulsions were more frequent and intense, elicited more discomfort, and were more often associated with distressing thoughts and negative mood than normal compulsions. Taken together, these studies seem to demonstrate that normal intrusions and rituals and their clinical counterparts constitute one dimension.

Researchers have speculated about the antecedents that may be involved in the transformation of normal intrusions and rituals. Two main research lines have addressed this issue in a systematic and well articulated manner. The first can best be referred to as the cognitive theory of obsession (Rachman, 1993, 1997, 1998a; Salkovskis, 1985). The core assumption of this approach is that the interpretation that a person gives to an intrusive thought determines the obsessive qualities of that intrusion. By this view, a person who feels extremely responsible for his or her thoughts, will experience more discomfort when an "immoral" thought (e.g., about sex or violence) intrudes consciousness than a person without such an inflated sense of responsibility. Persons suffering from an exaggerated sense of responsibility may think that immoral intrusions indicate them to be bad. Such an appraisal may add obsessive qualities (e.g., increased discomfort, tension, anxiety, and resistance) to intrusive thoughts.

Rachman, Thordarson, Shafran, and Woody (1995), presented a refined version of this cognitive account of OCD. That is, their work demonstrated that two types of cognitive biases are specifically associated with obsessive-compulsive symptoms. The first bias implies that having a thought of a particular, unpleasant situation (e.g., a car accident) increases the likelihood that such situation will actually occur. This bias is known as likelihood or probability bias. The second bias boils down to the notion that having immoral thoughts (even involuntary ones) about, for example, violence is as bad as immoral behaviour (e.g., acting violently). The latter bias is referred to as morality bias. Together, probability and morality bias constitute the concept of "thought-action fusion" (TAF; Shafran, Thordarson, & Rachman, 1996). TAF is thought to represent the tendency to overevaluate the significance and consequences of intrusive thoughts.

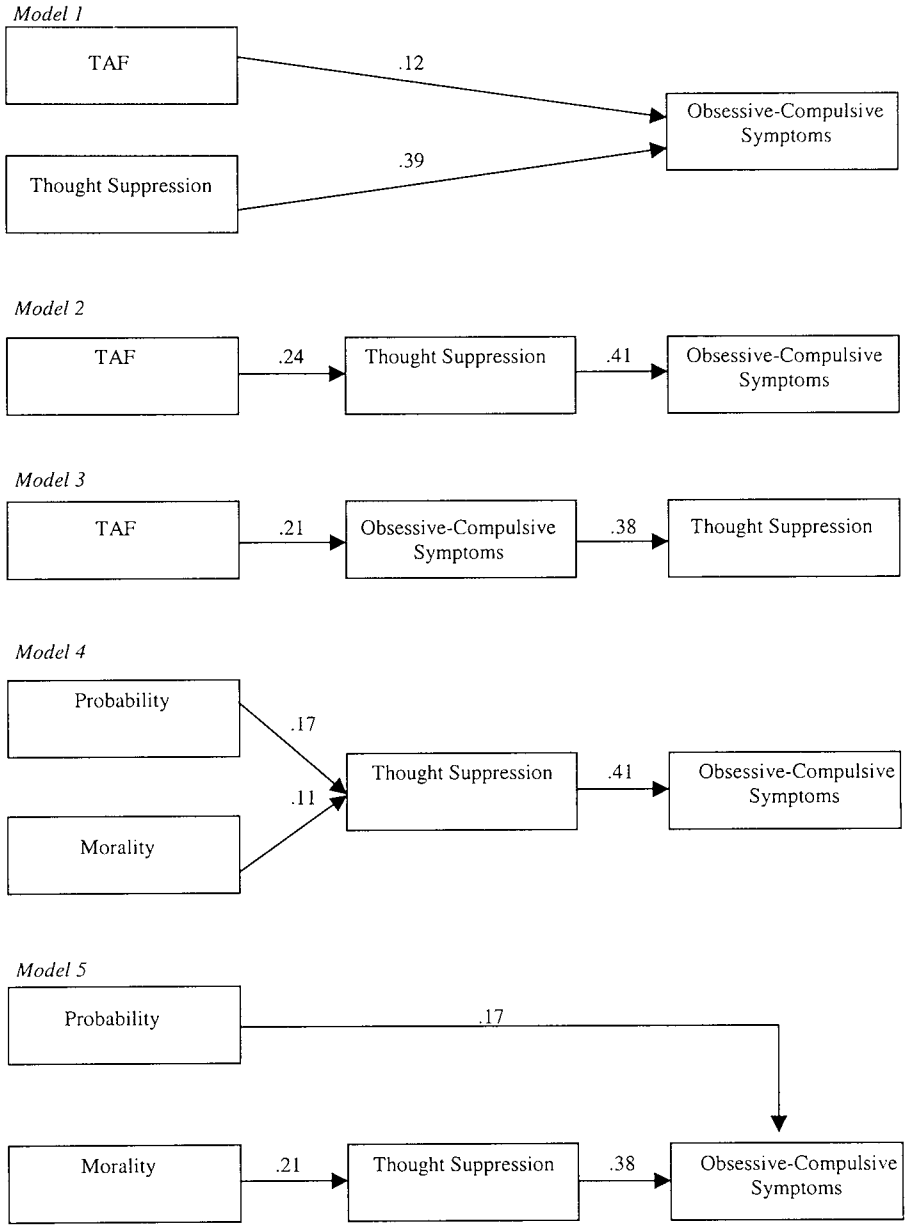
A second research line has emphasised the role of thought suppression in the exacerbation of intrusive thoughts. There is evidence to suggest that cognitive avoidance strategies such as thought suppression may be counterproductive. For example, Wegner, Schneider, Carter, and White (1987) found that suppression attempts result in more rather than less intrusions. This paradoxical phenomenon is often referred to as the "white bear effect". Clearly, an increased frequency of unwanted intrusions is in itself an obsessive feature. In addition, a heightened frequency may lead to more discomfort and increased perceived intensity. Accordingly, Wegner (1989, p. 167) claims that the paradoxical effect of thought suppression can result in full blown obsessions: "An obsession can grow from nothing but the desire to suppress a thought".

Note, in passing, that both research lines have focused on factors that intensify intrusive thinking, thereby assuming that compulsive behaviours are a function of intrusive thinking. In this view, compulsions can best be understood as a response to obsessions. This would imply that an exacerbation of intrusions is followed by an increase in compulsive behaviour. There are good reasons to believe that both TAF (see Rachman, Shafran, Mitchell, Trant, & Teachman, 1996) and thought suppression (see Rassin, Merckelbach, & Muris, in press), indeed, contribute to the exacerbation of obsessive-compulsive symptoms. However, little is known about the interactions between TAF and thought suppression. Of course, TAF may trigger suppression attempts. In Rachman's (1998a, p. 393) words: "an inflated increase in the significance attached to an unwanted intrusive thought, such as an obsession, will lead to more vigorous and intense attempts to suppress such thoughts". Another possibility is that the interaction between TAF and suppression takes the form of a vicious circle: "Given that patients can misinterpret the frequency with which they experience the obsession as evidence for the importance of the obsession (...), paradoxical increases in frequency that arise from attempts at suppression, may actually strengthen the catastrophic misinterpretation themselves. A vicious cycle is established" (Rachman, 1998a, p. 394). Still other interactions become possible when the two TAF components of probability and morality are considered separately (S. Rachman, personal communication, September 29, 1998). One could argue, for instance, that TAF-

probability may be directly related to obsessive-compulsive symptoms. Consider this example: a man who is plagued by a probability bias experiences an intrusion about his wife being involved in a car accident. Subsequent suppression attempts (even if successful) will not be sufficient to reassure him. Therefore, rather than cognitively avoiding the intrusion, he will engage in actions or cognitions that prevent the expected consequences (i.e., his wife actually crashing her car) from happening. For example, he might ask his wife not to travel by car, or he might engage in mental acts (e.g., praying). Thus, a probability bias may directly fuel obsessive-compulsive symptoms. On the other hand, a morality bias does not necessarily force the person who experiences an immoral intrusion to prevent anticipated consequences, since this type of bias does not involve such consequences. Following this line of reasoning, morality does not trigger neutralising rituals, but it may give rise to suppression, as intrusions are experienced as extremely unpleasant. If this analysis is correct, one would predict that probability directly increases obsessive-compulsive symptoms, whereas morality is thought to trigger suppression attempts which, in turn, lead via the paradoxical effect of thought suppression, to obsessive-compulsive symptoms. To sum up, then, there are a number of intuitively plausible models about the dynamics between TAF, thought suppression, and OCD. Yet, empirical evidence to evaluate the merits of these models is lacking.

The present study explored possible interactions between TAF and thought suppression in the exacerbation of obsessive-compulsive symptoms. Normal participants completed questionnaires measuring TAF, thought suppression, and obsessive-compulsive symptoms. Then, the relationships between these three constructs were examined by means of structural equation modelling. A number of plausible models were tested. In the first model, TAF and thought suppression independently contribute to obsessive-compulsive symptoms. In the second model, TAF leads to thought suppression, which, in turn, results in obsessive-compulsive symptoms. To investigate whether thought suppression actually is an antecedent of obsessive-compulsive symptoms, or, rather, a consequence of such symptoms, a third model was tested in which TAF leads to obsessive-compulsive symptoms, whereas these symptoms trigger thought suppression. In the fourth and fifth model, TAF was broken down in its probability and morality components. Model 4 followed the same route as Model 2, which means that both probability and morality result in thought suppression, while thought suppression leads to obsessive-compulsive symptoms. Model 5 tested the hypothesis that probability is directly related to obsessive-compulsive symptoms, whereas morality indirectly influences these symptoms through thought suppression. Figure 3.4.1 provides schematic representations of the 5 models. Note that Figure 3.4.1 also provides empirically established path coefficients.

Figure 3.4.1 *Schematic representations of the 5 models.*



Method

Participants

A sample of 173 undergraduate psychology students (131 females) participated in the study. They received a small financial compensation for their participation. Mean age was 19.1 years (*SD* = 1.7; range: 17-28 years).

Materials

Participants completed the following self-report questionnaires. The Thought-Action Fusion scale (TAF-scale; Shafran, Thordarson, & Rachman, 1996) consists of 19 items which are scored on a 5-point answer format (0 = *disagree strongly*; 4 = *agree strongly*). The TAF-scale taps two components (cf., supra): probability (7 items, e.g., "If I think of a relative/friend being in a car accident, this increases the risk that he/she will have a car accident") and morality (12 items, e.g., "If I wish harm on someone, it is almost as bad as doing harm"). A total TAF score can be calculated by summing all items. Higher scores indicate a stronger TAF-tendency, and, by implication, an inflated sense of responsibility for one's own thoughts.

The White Bear Suppression Inventory (WBSI; Wegner & Zanakos, 1994) consists of 15 items pertaining to the chronic tendency to suppress unwanted thoughts. WBSI items (e.g., "I always try to put problems out of mind") are scored on a 5-pointscale (1 = *strongly disagree*; 5 = *strongly agree*). Thus, total scores range from 15 to 75, with higher scores reflecting stronger tendencies to suppress unpleasant thoughts.

The Maudsley Obsessional-Compulsive Inventory (MOCI; Hodgson & Rachman, 1977) consists of 30 *true/false* items describing various obsessive-compulsive symptoms such as checking (e.g., "My major problem is repeated checking"), cleaning (e.g., "I avoid using public telephones because of possible contamination"), doubting (e.g., "Even when I do something very carefully I often feel that it is not quite right"), and slowness (e.g., "I am often late because I can't seem to get through everything on time"). Every endorsed item yields one point, so that total scores range from 0 to 30, with higher scores indicating the presence of more obsessive-compulsive symptoms.

Analyses

The structural equation modelling program EQS (Bentler, 1989) was used to analyse the data. EQS combines multiple regression and path analysis. It provides a powerful approach to test plausible models that may underlie a data set. EQS produces several goodness-of-fit indices indicating how well the tested model accounts for the observed correlational structure of the data. In the present study, the following indices were used: 1) the Chi-square (χ^2) Goodness-of-Fit value, which is required to be non-significant for the tested model to provide a good fit for the data, 2) the Average off diagonal Absolute Standardised Residuals (AASR), which should not exceed .05 in order for the model to fit the data well, 3) Akaike's Information Criterion (AIC) which is a fit index that takes into account the parsimony of the tested model (i.e., the number of included paths); AIC is a relative measure: that is to say, the model with the smallest number provides the best fit, and 4) the Comparative Fit Index (CFI) which compares the fit of the model with the hypothetical model in

which none of the variables are correlated. A CFI of .90 or higher indicates that the tested model fits the data well (see, for an extensive discussion of these indices, Schumacker & Lomax, 1996).

Results

Mean score on the TAF-scale was 21.1 (SD = 10.4). Means for the probability and morality subscales were 7.0 (SD = 4.8) and 14.2 (SD = 7.8), respectively. The average WBSI score was 50.6 (SD = 9.7), and the mean score on the MOCI was 6.7 (SD = 4.7). The internal consistency of the total TAF-scale (α = .87), TAF-probability (α = .77), TAF-morality (α = .86), WBSI (α = .86), and MOCI (α = .76) proved to be satisfactory. Table 3.4.1 presents Pearson product-moment correlations between the various questionnaires.

Table 3.4.1 *Pearson correlations between the various questionnaires (N = 173).*

	TAF-total	TAF-probability	TAF-morality	WBSI
TAF-probability	.70 *	-		
TAF-morality	.90 *	.32 *	-	
WBSI	.24 *	.16 *	.21 *	-
MOCI	.21 *	.23 *	.13	.41 *

Note. *TAF = Thought-Action Fusion scale; WBSI = White Bear Suppression Inventory; MOCI = Maudsley Obsessional-Compulsive Inventory.*
** $p < .01$.*

The fit indices for the 5 models are summarised in Table 3.4.2. As can be seen, Models 1 and 3 provide poor fits for the data. The χ^2-values reach significance ($p < .05$) and the unexplained variances of these models (AASR) exceed .05.

Table 3.4.2 *Fit-indices for the 5 models.*

	χ^2	p	AASR	AIC	CFI
Model 1	9.77	.00	.12	7.77	.78
Model 2	2.54	.11 *	.04 *	.54 *	.96 *
Model 3	7.69	.02	.05	3.69	.86
Model 4	5.73	.06 *	.04 *	1.73	.94 *
Model 5	1.87	.39 *	.03 *	2.13	1.00 *

Note. *AASR = Average off-diagonal Absolute Standardised Residuals; AIC = Akaike's Information Criterion; CFI = Comparative Fit Index.*
** Indicative for a good fit.*

Models 2, 4, and 5 have satisfactory fits. The χ^2-values for these models all remain non-significant ($p > .05$), there is little unexplained variance (AASR < .05), and the CFIs are good (> .90). Note also that Model 5 (in which probability leads to obsessive-compulsive symptoms, and morality leads to thought suppression) produces the best fit. The χ^2-value is non-significant (p = .39), the residuals are small (AASR = .03), and the CFI is high (1.00).

Discussion

The current results can be interpreted as follows. First, TAF and thought suppression seem to interact in the development of obsessive-compulsive symptoms, in that TAF leads to suppression attempts, while suppression, paradoxically, results in more obsessive-compulsive symptoms (Model 2). This causal chain is more likely than a scenario in which TAF and suppression independently contribute to such symptoms (Model 1). Furthermore, the results suggest that suppression is, indeed, an antecedent of obsessive-compulsive symptoms, rather than a mere reaction to such symptoms (as is the case in Model 3). When TAF is broken down into its probability and morality components, a causal model assuming that these two biases trigger thought suppression, which, in turn, results in more obsessive-compulsive symptoms, still provides a good fit for the data (Model 4). However, given the data, it seems more likely that the probability bias directly affects obsessive-compulsive symptoms (Model 5).

Some limitations of the present study should be acknowledged. First, the study relied on a sample of healthy participants. Future studies should examine whether the current results can be replicated in a clinical sample. Second, the study relied on concurrent measurements. Nevertheless, the results fit nicely with current theoretical notions on the aetiology of obsessive-compulsive symptoms and they may help to design experiments examining the interactions between TAF and suppression.

The current findings imply that TAF is a more fundamental cause of obsessive-compulsive symptoms than is thought suppression. Given that the Models 2, 4, and 5 all fit better than Model 1, thought suppression seems to have an intermediate role between TAF and obsessive-compulsive symptoms, rather than a primary causal one. This underscores the idea that therapeutic interventions for OCD should address patients' cognitive biases. To the extent that these biases are corrected, the urge to engage in thought suppression should also decrease. On the other hand, reducing the chronic avoidant coping style, would leave the TAF bias intact. This analysis suggests that the TAF bias deserves priority. Thus, the present results support Rachman's conclusion "that the most direct and satisfactory treatment of obsessions is to assist patients in the modification of the putatively causal catastrophic misinterpretations of the significance of their intrusive thoughts. Bluntly, if these misinterpretations are 'corrected', the obsession should cease" (1997, p. 799).

3.5 Thought-action fusion and thought suppression in Obsessive-Compulsive Disorder

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Behaviour Research and Therapy, in press

Abstract

To examine the significance of thought-action fusion (TAF) and thought suppression tendencies, the present study obtained pre- and post-treatment questionnaire data on these constructs in a sample of OCD patients (n = 24) and non-OCD anxiety patients (n = 20). Results indicate that TAF and suppression are correlated with severity of psychopathology. Yet, the associations between TAF and psychopathology are not typical for OCD, but do also occur in other anxiety disorders (e.g., Panic Disorder, Post Traumatic Stress Disorder, and Social Phobia). As well, mean scores on the TAF and thought suppression measures dropped significantly from pre- to post-treatment, indicating that TAF and thought suppression are susceptible to change during psychotherapy.

[5] Acknowledgement. This study was made possible by the "Overwaal" Clinic, Nijmegen, The Netherlands.

In their by now classic study, Rachman and De Silva (1978; see also Salkovskis & Harrison, 1984) noted that everyday intrusions and clinical obsessions as seen in Obsessive-Compulsive Disorder (OCD; American Psychiatric Association, 1994) do not differ in content. Differences between both kinds of intrusions do occur, however, with respect to frequency, intensity, discomfort, and elicited resistance, with clinical obsessions being characterised more strongly by these qualities than "normal" intrusions. To account for the similarities and differences between normal and abnormal intrusions, two theories have been invoked. The first emphasises the importance of the interpretation that people give to their intrusions (Rachman, 1993, 1997, 1998a; Salkovskis, 1985). According to this cognitive theory, obsessional problems may arise when individuals experience an inflated sense of responsibility for their own thoughts. For example, the believe that intrusive thoughts reveal one's true nature will lead to more discomfort whenever unwanted violent and/or sexual intrusions occur. Such biased appraisals may add obsessive qualities (e.g., increased discomfort, tension, anxiety, and resistance) to intrusive thoughts. Rachman, Thordarson, Shafran, and Woody (1995) articulated a refined version of this cognitive account of OCD. According to this version, two types of cognitive bias may be specifically involved in the development of obsessive-compulsive symptoms (see also Emmelkamp & Aardema, 1999). The first bias consists of the tendency to believe that merely thinking about an unpleasant situation (e.g., a car accident) increases the likelihood that this situation will actually occur. This bias is known as the likelihood or probability bias. The second bias consists of the tendency to believe that having immoral thoughts (even involuntary ones) about, for example, violence is as bad as immoral behaviour (e.g., acting violently). This bias is termed morality bias. Together, probability and morality bias constitute the essential elements of what has been dubbed "thought-action fusion" (TAF; Shafran, Thordarson, & Rachman, 1996). In general terms, TAF refers to the tendency to overvalue the significance and consequences of intrusive thoughts.

A second theory, addressing the similarities and differences between normal and clinical intrusions focuses on the role of thought suppression in the exacerbation of intrusive thoughts. There is good reason to believe that under some conditions, cognitive avoidance strategies such as thought suppression may be counterproductive. For example, in their often cited studies, Wegner, Schneider, Carter, and White (1987) showed that suppression attempts result in more rather than less intrusions. This paradoxical phenomenon is known as the "white bear effect", because Wegner et al. used thoughts of white bears as targets. While the content of this target is, of course, neutral, its heightened frequency is, at least to some extent, reminiscent of obsessional thinking. Most importantly, such a heightened frequency may elicit discomfort. Accordingly, Wegner (1989) claims that the paradoxical effect of thought suppression may result in full blown obsessions: "An obsession can grow from nothing but the desire to suppress a thought" (p. 167).

There is some evidence to suggest that both TAF (e.g., Rassin, Merckelbach, Muris, & Spaan, 1999) and thought suppression (see Purdon, 1999) are

implicated in obsessive-compulsive symptomatology. Some authors have even speculated that TAF and thought suppression may interact in the development of obsessional problems and there are some preliminary results that support this position (Rachman, 1998a; Rassin, Muris, Schmidt, & Merckelbach, 2000). However, a number of questions remain to be answered. For example, there is some dispute about the question of whether thought suppression is a causal antecedent of OCD-related symptoms or rather a consequence or part of such symptoms (see Rassin, Merckelbach, & Muris, in press). Furthermore, it is relevant to determine to what extent TAF and suppression tendencies are susceptible to change due to therapeutic intervention. Rachman (1997) emphasises that in the treatment of OCD, changing misinterpretations of intrusions is an important goal: "It follows from the theory that the most direct and satisfactory treatment of obsessions is to assist patients in the modification of the putatively causal catastrophic misinterpretations of the significance of their intrusive thoughts. Bluntly, if these misinterpretations are 'corrected', the obsession should cease" (p. 799). As to thought suppression, it should be noted that Wegner and Zanakos (1994) tend to think of this mental control strategy as a stable, trait like coping style. In their words: "self-reports of thought suppression are reliable over time and thus fulfill an important criterion for recognition as a trait" (p. 624). By this view, thought suppression tendencies should be resistant to change.

In the present study, the significance of TAF and thought suppression was examined by administering self-report instruments to OCD patients prior to and after therapy. If TAF and thought suppression tendencies act as important determinants of obsessional problems, one would expect that pre-treatment scores on questionnaires tapping these phenomena predict symptom severity and, perhaps, treatment efficacy. Also, if TAF and thought suppression are trait like phenomena, one would anticipate that pre- and post-treatment scores on these questionnaires remain fairly constant.

Method

Patients

Forty-four patients (32 women) participated in the study. Mean age was 32.8 years (SD = 9.2; range: 18-58). Two groups of patients were formed. The first consisted of 24 patients (16 women) who met DSM-IV criteria for OCD (American Psychiatric Association, 1994). The second group consisted of 20 patients (16 women) who suffered from other anxiety disorders, such as Panic Disorder (n = 7), Post Traumatic Stress Disorder (n = 4), and Social Phobia (n = 4). None of them had a comorbid diagnosis of OCD. There were no group differences with respect to age ($t[42] = 1.4$, $p = .17$) or gender ($\chi^2 < 1.0$). All participants received treatment at the Overwaal Clinic, Nijmegen, The Netherlands. This is an inpatient facility specialised in the treatment of anxiety disorders.

Procedure and measures

Patients completed a number of questionnaires (see below) on two occasions: during admission to the clinic (before treatment) and at the end of their

treatment. Treatment consisted of cognitive-behavioural interventions, the precise nature of which depended on the type of symptoms (e.g., exposure and response prevention in the case of OCD, cognitive therapy in the case of Panic Disorder). Mean treatment duration was 5.9 months (SD = 2.1; range: 2-10 months). Before and after treatment, patients filled in the TAF-scale (Shafran et al., 1996), the White Bear Suppression Inventory (WBSI; Wegner & Zanakos, 1994), the Maudsley Obsessional-Compulsive Inventory (MOCI; Hodgson & Rachman, 1977), and the Symptoms Checklist (SCL-90; Derogatis, 1977).

The TAF-scale (pre-treatment Cronbach's alpha = .91; N = 44) contains 19 items addressing the morality bias (12 items, e.g., "Having a blasphemous thought is almost as sinful to me as a blasphemous action", α = .92), the probability-for-self bias (3 items, e.g., "If I think of myself falling ill, this increases the risk that I will fall ill", α = .74), and the probability-for-others bias (4 items, e.g., "If I think of a relative/friend being in a car accident, this increases the risk that he/she will have a car accident", α = .91). All items are answered on a 5-pointscale (0 = *disagree strongly*; 4 = *agree strongly*). Total scores range from 0 to 76, with higher scores indicating stronger TAF.

The WBSI (α = .85) is a 15-items self-report instrument that addresses the habitual tendency to suppress unwanted thoughts. A typical WBSI item is "I always try to put problems out of mind". Items are answered on a 5-pointscale (1 = *strongly disagree*; 5 = *strongly agree*). Total scores (range: 15-75) are obtained by summing across items. Higher scores indicate stronger tendencies to suppress unwanted thoughts.

The MOCI (α = .83) consists of 30 *yes/no* items (e.g., "I spend a lot of time every day checking things over and over again") that describe various obsessive-compulsive symptoms, namely checking (α = .84), cleaning (α = .69), slowness (α = .60), and doubting (α = .50). Every endorsed item yields one point. Higher total scores (range: 0-30) reflect the presence of more obsessive-compulsive symptoms.

The SCL-90 (α = .96) is a widely used self-report index of general psychopathology. It measures a broad range of psychopathological symptoms such as anxiety, depression, obsessional problems, and sleep disturbances. Items are answered on a 5-pointscale (1 = *not at all*; 5 = *a lot*). Total scores range from 90 to 450 with higher scores indicating more self-reported psychopathology.

Results

Mean scores on self-reports for patients with OCD and patients with other anxiety disorders are summarised in Table 3.5.1. A 2 (groups) x 2 (time: pre-treatment versus post-treatment) multivariate analysis of variance (MANOVAR) with repeated measures on the last factor revealed a main effect of time. That is, scores on all measures dropped significantly from pre- to post-treatment: $F(4,38) = 13.4$, $p < .001$. Furthermore, there was a main effect of group: $F(4,38) = 3.0$, $p = .03$. This effect was carried by a group difference in MOCI scores ($p < .01$). The group x time interaction failed to attain significance: $F(4,38) = 2.2$, $p = .09$.

Table 3.5.1 *Mean pre- and post-treatment scores (and standard deviations) on questionnaires for OCD patients (n = 24) and patients suffering from other anxiety disorders (n = 20).*

	OCD		Other anxiety disorders	
	pre-treatment	post-treatment	pre-treatment	post-treatment
TAF-scale	31.5 (15.0)	25.4 (14.6)	30.7 (14.1)	19.9 (16.3)
morality	21.5 (10.5)	18.9 (11.3)	20.3 (10.6)	13.5 (11.1)
probability-self	5.0 (3.1)	3.6 (3.2)	5.6 (2.9)	3.3 (3.2)
probability-others	4.9 (5.0)	2.9 (3.9)	4.9 (4.4)	3.2 (4.3)
WBSI	57.7 (11.0)	53.9 (12.4)	60.0 (8.6)	51.4 (12.4)
MOCI	14.0 (5.8)	9.0 (5.1)	9.3 (4.6)	6.0 (4.0)
checking	5.2 (3.0)	3.2 (2.6)	3.7 (2.2)	2.1 (2.1)
cleaning	3.1 (2.5)	1.8 (2.0)	1.3 (1.2)	1.3 (1.0)
slowness	3.5 (1.6)	1.9 (1.7)	2.7 (1.6)	1.5 (1.5)
doubting	4.4 (1.6)	3.5 (1.9)	3.5 (1.8)	2.3 (1.6)
SCL-90	229.5 (62.3)	157.5 (43.6)	233.8 (48.8)	166.4 (48.3)

Note. *TAF-scale = Thought-Action Fusion scale; WBSI = White Bear Suppression Inventory; MOCI = Maudsley Obsessional-Compulsive Inventory; SCL-90 = Symptoms Checklist.*

To examine their specificity, Pearson product-moment correlations were computed between pre-treatment TAF and thought suppression, on the one hand, and pre-treatment psychopathology, on the other hand. This was done for OCD and non-OCD patients, separately. The results are shown in Tables 3.5.2 and 3.5.3. As can be seen, TAF and its components were found to correlate with some of the obsessional and general psychopathology measures (i.e., MOCI and SCL-90, respectively) in both groups of patients. In contrast, thought suppression (i.e., WBSI) was found to correlate with obsessional and general psychopathology in OCD patients, but not in patients with other disorders.

Table 3.5.2 *Pre-treatment correlations between questionnaires for OCD patients (n = 24).*

	WBSI	MOCI	checking	cleaning	slowness	doubting	SCL-90
TAF-scale	.15	.36	.40	.25	.19	.11	.45 *
morality	-.05	.25	.30	.13	.16	.06	.43 *
probability-self	.38	.42	.27	.52 *	.35	.16	.22
probability-others	.32	.28	.40	.18	.01	.09	.31
WBSI		.61 **	.65 **	.35	.45 *	.53 **	.55 **
MOCI			.87 **	.70 **	.72 **	.76 **	.61 **

Note. *TAF-scale = Thought-Action Fusion scale; WBSI = White Bear Suppression Inventory; MOCI = Maudsley Obsessional-Compulsive Inventory; SCL-90 = Symptoms Checklist.*
** p < .05; ** p < .01.*

To investigate whether TAF and thought suppression underwent changes during therapy, correlations between pre- and post-treatment scores were calculated. As can be seen in Table 3.5.4, TAF and thought suppression possessed some temporal stability in OCD patients. In patients suffering from other disorders, such stability was less evident. Even after the influence of MOCI and SCL-90 was partialled out, total TAF-scale, morality, probability-self, probability-others, and WBSI scores of OCD patients remained

significantly correlated over time (partial *r*s = .83, .86, .83, .78, and .53, respectively).

Table 3.5.3 *Pre-treatment correlations between questionnaires for patients suffering from other anxiety disorders (n = 20).*

	WBSI	MOCI	checking	cleaning	slowness	doubting	SCL-90
TAF-scale	.22	.48 *	.61 **	.24	.28	.13	.43
morality	.19	.42	.52 *	.25	.28	.13	.45 *
probability-self	.05	.08	.22	.01	-.24	.06	.01
probability-others	.20	.47 *	.58 **	.15	.54 *	.05	.30
WBSI		.15	.19	-.08	.07	.20	.31
MOCI			.89 **	.61 **	.70 **	.70 **	.08

Note. TAF-scale = Thought-Action Fusion scale; WBSI = White Bear Suppression Inventory; MOCI = Maudsley Obsessional-Compulsive Inventory; SCL-90 = Symptoms Checklist.
** p < .05; ** p < .01.*

Table 3.5.4 *Correlations between pre- and post-treatment measurements for OCD patients (n = 24) and patients suffering from other anxiety disorders (n = 20).*

	OCD	Other anxiety disorders
TAF-scale	.62 **	.40
morality	.65 **	.53 *
probability-self	.74 **	.07
probability-others	.69 **	.56 *
WBSI	.52 **	.43
MOCI	.43	.43
checking	.52 *	.41
cleaning	.63 **	.49 *
slowness	.18	.71 *
doubting	.49 *	.14
SCL-90	.31	.20

Note. TAF-scale = Thought-Action Fusion scale; WBSI = White Bear Suppression Inventory; MOCI = Maudsley Obsessional-Compulsive Inventory; SCL-90 = Symptoms Checklist.
** p < .05; ** p < .01.*

To examine the impact of TAF and thought suppression tendencies on treatment efficacy, pre-treatment TAF-scale and WBSI scores were correlated with pre- to post-treatment changes in MOCI and SCL-90 scores (corrected for pre-treatment MOCI and SCL-90 scores). Neither TAF-scale (including subscales) nor WBSI scores correlated with changes in MOCI or SCL-90. This was true for OCD patients (highest correlation = .23, *n.s.*) as well as non-OCD patients (highest correlation = -.30, *n.s.*).

Discussion

The results of the present study can be summarised as follows. First, no indications were found to suggest that TAF is specifically tied to OCD. Not only did OCD and non-OCD patients have similar pre- and post-treatment scores on the TAF-scale, there were also significant correlations between pre-treatment TAF and psychopathology in the non-OCD patient group. As to thought suppression, OCD and non-OCD patients did not differ in their pre-

treatment scores on the WBSI, but in this case, significant associations between pre-treatment thought suppression scores and psychopathology were only evident for the OCD group. Taken together, these findings suggest that thought suppression and, especially TAF are not, or only to a moderate degree, specifically linked to OCD. In other words, TAF and thought suppression seem to possess a broad relevance. In this particular respect, their position seems to be similar to that of attentional bias, which is also a phenomenon that occurs in a wide variety of anxiety disorders, though its ramifications might be greater in some conditions than in other (e.g., Williams, Watts, MacLeod, & Mathews, 1997). Indeed, thought suppression has been documented in such diverse conditions as PTSD, Generalised Anxiety Disorder, and phobia (see, for reviews Purdon, 1999; Rassin, Merckelbach, & Muris, in press). Much the same may be true for TAF. For example, Shafran, Teachman, Kerry, and Rachman (1999) argued that a TAF like bias ("thought-shape fusion") may be related to maladaptive dieting habits that occur in eating disorders.

The absence of correlations between TAF and thought suppression is somewhat surprising. In theory, the increased discomfort caused by TAF might be a strong reason to engage in cognitive avoidance strategies such as thought suppression. In the words of Rachman (1998a): "an inflated increase in the significance attached to an unwanted intrusive thought, such as an obsession, will lead to more vigorous and intense attempts to suppress such thoughts" (p. 393). However, results suggest that the participants in the current study tended to react with other coping strategies to TAF (e.g., checking and cleaning; see also Shafran et al., 1996).

Second, correlational analyses indicated that TAF and thought suppression exhibit some kind of temporal stability in OCD, but hardly or not in other anxiety disorders. Thus, while TAF and thought suppression occur in a variety of conditions, their tenacity might be greater in OCD than in other anxiety disorders. Clearly, this point warrants further study. Third, despite the significant longitudinal correlations of TAF and thought suppression, mean scores on all measures dropped significantly after treatment. This suggests that TAF and thought suppression are accessible to and can be modified by therapeutic interventions. Of course, in the absence of adequate control groups, the present data can not address the issue of whether some therapies are more effective in this respect than others. Furthermore, little or nothing is known about the natural course of TAF and thought suppression tendencies in OCD. Future studies should look at this important topic.

The fourth finding revolves around the hypothesis that strong pre-treatment TAF and thought suppression tendencies might hinder treatment efficacy. Thus, higher scores on the TAF-scale and WBSI at therapy outset were expected to be related to smaller reductions in MOCI and SCL-90 scores. Results indicate, however, that this was not the case. That is, TAF-scale and WBSI scores were not found to be correlated with reduction in self-reported psychopathology. Thus, the pathology maintaining potential that is ascribed to TAF and suppression is not borne out by the data. In fact, our results can be more readily accommodated by the view that TAF and thought suppression are features of

pathological anxiety. This is not to say that TAF and thought suppression may not intensify the development of obsessional problems, but rather that the current data do not support the notion that TAF and thought suppression play a maintaining role in OCD. An interesting alternative angle [6] is that the therapeutic intervention decreased TAF and thought suppression tendencies, which in turn resulted in attenuation of psychopathology. The finding that pre- to post-treatment changes in TAF and thought suppression correlated significantly with changes in self-reported psychopathology (after the influence of pre-treatment scores was partialled out, correlations ranged between .46 and .55, $ps < .01$) may be considered to indirectly support the idea that changes in pathology were mediated by therapy-induced changes in TAF and thought suppression.

Three limitations of the present study deserve some comment. First, our study relied on inpatients. It may well be the case that a higher degree of specificity and stability of TAF and thought suppression would be found if outpatients were examined. Second, our study did not include follow-up measures. Meanwhile, it is possible that the role of TAF and thought suppression in maintaining psychopathology becomes only evident when follow-up data are collected in the months after treatment. Third, our study did not include a normal control group, and TAF and thought suppression were measured at a point in time when psychopathology had already developed.

To sum up, then, our results suggest that TAF and thought suppression 1) are not exclusively linked to OCD, and 2) are susceptible to change.

[6] Thanks to an anonymous reviewer for this comment.

3.6 Overview of findings

In hindsight, the original thought suppression experiments of Wegner, Schneider, Carter, and White (1987) started off a considerable quantity of suppression studies. Thus, Wegner et al. initiated an important research line that has increased our insight in cognitive mechanisms underlying obsessional problems. However, the thought suppression paradigm does not address the question which reasons people may have to engage in cognitive avoidance strategies. According to Wegner (1989), such reasons are irrelevant, because the mere act of suppressing thoughts suffices to develop an obsession. In this way, the thought suppression paradigm has largely ignored a second research line addressing cognitive factors involved in the transformation of normal intrusions into clinical obsessions, that is, the cognitive theory of obsession (Rachman, 1993, 1997, 1998a; Salkovskis, 1985). The catastrophic misinterpretation of intrusive thoughts (a central element in the cognitive theory) provides a strong reason to suppress unwanted intrusions. In the words of Rachman (1998a): "an inflated increase in the significance attached to an unwanted intrusive thought, such as an obsession, will lead to more vigorous and intense attempts to suppress such thoughts" (p. 393).

The studies described in this chapter sought to combine the thought suppression paradigm with insights from the cognitive theory of obsession. Paragraph 3.2 focused on the association between thought suppression and compulsions in normal participants. From this study, it can be concluded that thought suppression, as measured by the White Bear Suppression Inventory (WBSI; Wegner & Zanakos, 1994), is associated with clinical characteristics of rituals (i.e., intensity, discomfort, and resistance). Although it is tempting to interpret these results as suggesting that suppression of unwanted thoughts paradoxically leads to more intrusions resulting in stronger urges to engage in neutralising compulsions, two remarks are in line. First, the association between the WBSI and the characteristics of rituals survived the partialling out of the Symptoms Checklist (SCL-90; Derogatis, 1977) obsession scale (but see Woody, Steketee, & Chambless, 1995, for the validity of this measure). This suggests that the association between thought suppression and rituals is not necessarily mediated by obsessional intrusions. Second and more importantly, the correlational nature of the data in this study precludes causal inferences. Thus, the possibility that participants directly suppressed the urge to engage in ritualistic behaviour can not be excluded. Even so, the observed correlation between thought suppression and compulsions was not found in earlier studies (see Wegner & Zanakos, 1994).

The study described in paragraph 3.3 presented an experimental analysis of thought-action fusion (TAF; see Shafran, Thordarson, & Rachman, 1996). The findings in this study indicate that an induced probability bias results in efforts to avoid the target thought (i.e., thought suppression) as well as neutralising compulsions. Similar findings were obtained in paragraph 3.4. This study was concerned with correlations between self-report instruments measuring TAF, thought suppression, and obsessive-compulsive symptoms. These correlations were further analysed by means of structural equation modelling. As in the previous paragraph, the results in paragraph 3.4 suggest that TAF gives rise to

suppression attempts and compulsions. Surprisingly, in a clinical sample, no associations between TAF and thought suppression were observed (paragraph 3.5). Possibly, the correlation between TAF and thought suppression was suppressed by the presence of other responsibility biases. It is important to note that TAF refers to just two out of many responsibility biases (see paragraph 3.1). Rachman, Thordarson, Shafran, and Woody (1995) found that TAF correlated more strongly with measures of obsessional problems than did three other biases. However, their study relied on a non-clinical sample of undergraduate students. Perhaps, TAF is more closely related to obsessional problems in non-Obsessive-Compulsive Disorder (OCD) patients and normal controls than it is in patients suffering from OCD. The main conclusions to be drawn from paragraph 3.5 are that TAF and thought suppression tendencies can be attenuated and are not specifically tied to OCD, but also occur in other anxiety disorders.

An important topic for future studies is whether thought suppression significantly contributes to the development of obsessional problems in presence of a responsibility bias. Previous research has suggested that a responsibility bias suffices to add obsessional qualities to intrusive thoughts (Ladouceur et al., 1995; Rachman, Shafran, Mitchell, Trant, & Teachman, 1996; Rassin, Merckelbach, Muris, & Spaan, 1999). Hence, the question arises whether thought suppression adds (due to the paradoxical effects) extra weight to the discomfort that is already present because of the responsibility bias. Alternatively, thought suppression may, in this case, be nothing more than a symptomatic reaction (i.e., an epiphenomenon) to the stress that is elicited by the unwanted intrusion. To examine this issue, an experimental design would have to be developed in which a responsibility bias is induced in all participants. Furthermore, half of the participants need to be instructed to suppress the target thought, while the other half should be prevented from engaging in cognitive avoidance (see Purdon, 1999). With this design, group differences, if any, in intrusion frequency, discomfort, and so on can be attributed to thought suppression.

The scope of the thought suppression paradigm and cognitive theory

Wegner (1989) distinguishes two kinds of intrusions: traumatic intrusions (which are rooted in an experienced traumatic event) and synthetic intrusions (which lack an obvious cause). According to Wegner, both kinds of intrusions can develop into an obsession, merely due to thought suppression. Not only do suppression attempts fail, they also produce a rebound effect which in turn leads to a preoccupation with the target thought. The combination of suppression attempts (when the pertinent thought is unwanted) and periods during which the thought is not actively suppressed (in these periods, thought rebounds occur) is referred to as indulgence cycles. In Wegner's (1989) words: "The obsessions we develop from traumas, for instance, are clearly there prior to our desires for avoidance. The ruminations we may have that recall past traumas, then, are often suppressed after they occur. But when no obvious trauma is present, there is the good possibility that the obsession has crept up

on us slowly, synthsesized over time by a series of our own acts of suppression" (p. 173), and: "What this means is that the development of a synthetic obsession is totally dependent on suppression as the first step" (p. 173). By this view, any thought or impulse that becomes the target of suppression attempts can be transformed into an obsession. This is even true for neutral or pleasant thoughts. For example, sexual fantasies about a person with a prior engagement may be suppressed and become a preoccupation. Thoughts about a pleasant holiday may be experienced as inappropriate in a time of grief. Hence, such thoughts may be suppressed, resulting in thought rebound and preoccupation. In short, according to Wegner (1989), the thought suppression paradigm is relevant to any obsession, regardless of its content. It should be noted that this paradigm primarily explains the increased frequency of intrusions. Other obsessional characteristics (e.g., discomfort, anxiety, and neutralisation attempts) are largely left unexplained. These characteristics are, thereby, secondary to the increased frequency of intrusive thoughts.

In this respect, the cognitive theory of obsession differs from the thought suppression paradigm. Several researchers have argued that OCD can be subdivided into differential categories based on content and symptoms. For example, Calamari, Wiegartz, and Janeck (1999) propose that obsessive thoughts of OCD patients can be grouped into five clusters: harming, hoarding, contamination, certainty, and rumination. Summerfeldt, Richter, Antony, and Swinson (1999) performed a factor analysis on data obtained from 203 OCD patients and concluded that a multilevel four factor model described the symptoms in this sample best. These authors reported symptoms ranging from aggressive, religious, and somatic obsessions to repetition, counting, and hoarding compulsions. Interestingly, the cognitive theory of obsession does not pretend to be applicable to all of these differential manifestations of OCD. The core assumption of this theory is that the patient experiences some kind of inflated responsibility for his thoughts, resulting in feared anticipated consequences. Thus, this theory may explain symptoms related to harming, aggressive, and contamination obsessions, as well as compulsive checking and cleaning. On the other hand, the cognitive theory may be of lesser importance in case of hoarding and somatic obsessions, and repetition and counting rituals. As mentioned before, the thought suppression paradigm is somewhat less articulated when it comes to its explanatory power with regard to differential manifestations of OCD.

Although Wegner (1989) claims that thought suppression may be a sufficient cause of obsessional problems, its role within the cognitive theory is more modest. In the cognitive theory of obsession, the (mis)interpretation of intrusive thoughts plays a crucial role in the development of obsessions. Thought suppression may increase the frequency of intrusions and is therefore an ineffective reaction to intrusive thoughts just like engaging in neutralisation. However, the cognitive theory does not view thought suppression as a necessary causal factor, but rather as a maintaining or exaggerating one.

In sum, anxiety due to the misinterpretation of intrusions may provide a strong reason to suppress intrusions. Thus, the thought suppression paradigm

can be assimilated by the cognitive theory of obsession (see Salkovskis, 1999). This combination of the thought suppression paradigm and the cognitive theory implies a twofold restriction of Wegner's (1989) claim that suppression can turn any intrusion into an obsession. First, the cognitive theory seems to pertain only to a subcategory of obsessional problems. Second, the role of thought suppression in the cognitive theory is not that of a primary causal factor, but rather that of a counterproductive reaction to anticipation anxiety resulting in maintenance of complaints.

4

THOUGHT SUPPRESSION AND MEMORY

4.1 Introduction

The studies described in the previous chapter pertained to the role of thought suppression in the development or maintenance of obsessive-compulsive symptoms. However, cognitive intrusions other than obsessions may also become the target of suppression attempts. For example, Acute Stress Disorder (ASD) and Post Traumatic Stress Disorder (PTSD) are characterised by recurrent intrusive memories of the experienced traumatic event. Also, depression seems to be associated with an increase in intrusive memories (see Brewin, Watson, McCarthy, Hyman, & Dayson, 1998; Kuyken & Brewin, 1994). There is some evidence to suggest that intrusive memories may indeed elicit suppression attempts (e.g., Davies & Clark, 1998; Kuyken & Brewin, 1994; Shipherd & Beck, 1999). Once autobiographical memories become the targets of suppression attempts, the possible consequences of thought suppression go beyond the frequency of subsequent intrusions. In this case, thought suppression might also influence the content of intrusive (and maybe even non-intrusive) memories. Interestingly, memories of traumatic events are sometimes claimed to differ from non-emotional memories. More specifically, traumatic experiences seem to result in intense and lively intrusive flashbacks, while at the same time, intentional retrieval of the traumatic memory is difficult and fragmented (Ehlers & Clark, 2000). Memories of depressed individuals are sometimes reported to lack detailedness, a phenomenon referred to as overgeneral memory (e.g., Brewin, Hunter, Carroll, & Tata, 1996; Brewin, Reynolds, & Tata, 1999; Kuyken & Dalgleish, 1995; see, for a study of overgeneral memories in depressed OCD patients, Wilhelm, McNally, Baer, & Florin, 1997). It is tempting to attribute these odd memory characteristics to thought suppression. For example, Kuyken and Brewin (1995) found that "patients reporting high levels of avoidance of spontaneous memories ... in the past week retrieved more overgeneral memories" (p. 585; but see Wenzlaff & Bates, 1998, for a study of how suppression might mask depressive symptoms).

Wegner, Quillian, and Houston (1996) conducted an experimental study addressing the role of thought suppression in the development of special characteristics of traumatic memories (i.e., the combination of isolated lively flashbacks and intentional retrieval difficulties). They showed their participants a short film clip and, subsequently, assigned them to one of three conditions: suppression (i.e., avoid thinking about the film during the rest of the day), thinking (i.e., promote thinking about the film), and no-instruction control. Five hours later, participants returned to the lab where their memory of the film was tested. Results suggested that suppression participants had a somewhat poorer memory than participants in the other conditions. That is, they were less able to reproduce the chronology of events in the film clip than other participants. Furthermore, suppression participants experienced their memory of the film as more fragmented and snapshot like than did the other participants. According to Wegner et al. (1996), these findings suggest that thought suppression may, indeed, be partly responsible for the characteristics of traumatic memories (i.e., the development of isolated intrusions and difficulties with retrieving the complete memory).

Chapter outline

This chapter focuses on the effects of thought suppression on memory. The study by Wegner et al. (1996) is innovative, because the alleged memory effects of thought suppression had not been studied experimentally before. It should be noted that, whereas Wegner et al. (1996) discuss their findings in the light of traumatic memory, they used an "interesting but nontraumatic" (p. 682) film clip. The study described in paragraph 4.2 is comparable to that of Wegner et al., with the exception that it relied on an emotional film clip. Such a film was chosen to enhance the validity of the experiment as a laboratory model for PTSD. In paragraph 4.3, a similar experiment is described. This particular experiment employed a neutral stimulus. More specifically, the Gudjonsson Suggestibility Scale (GSS; Gudjonsson, 1984, 1997) was used to study the effects of thought suppression on memory. Paragraph 4.4 describes a study that was concerned with correlations between the White Bear Suppression Inventory (Wegner & Zanakos, 1994) and self-reported memory characteristics of an experienced traumatic event. The final paragraph (4.5) summarises and discusses the main findings of the various studies.

4.2 Effects of thought suppression on episodic memory

Eric Rassin, Harald Merckelbach, and Peter Muris

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Abstract

Participants were shown a short film fragment. Following this, one group of participants (n = 26) was instructed to suppress their thoughts about the film, while the other group (n = 24) received no instructions. After 5 hours, participants returned to the laboratory and completed a questionnaire testing their memory about the film. Results showed that suppression participants reported a higher frequency of thoughts about the film than control participants. No evidence was obtained for Wegner, Quillian, and Houston's (1996; *Journal of Personality and Social Psychology*, *71*, 680-691) claim that suppression has an undermining effect on memory for chronology. Possible causes for the differences between the results as obtained by Wegner et al., and those found in the present study are discussed. These causes may pertain to the experimental design, but also to differences in emotional impact of the stimulus material that was used in both studies.

Thought suppression refers to the process of consciously trying to prevent certain thoughts from entering working memory (Wegner, 1989). A number of laboratory and field studies have found that in normal participants, attempts to suppress certain thoughts produce paradoxical effects, that is, promote the frequency with which the target thought intrudes the stream of consciousness (the so-called "white bear" effect; e.g., Roemer & Borkovec, 1994; Salkovskis & Campbell, 1994; Wegner, Schneider, Carter, & White, 1987). Much the same seems to be true for clinical populations. That is, there are indications that in patients with anxiety disorders (e.g., spider phobia, dental phobia, Generalised Anxiety Disorder), suppression of emotional or threat-relevant topics contributes to the intrusive character of these topics (e.g., Becker, Rinck, Roth, & Margraf, 1998; De Jongh, Muris, Merckelbach, & Schoenmakers, 1996; Muris, Merckelbach, Horselenberg, Sijsenaar, & Leeuw, 1997). Interestingly, there is also evidence that in individuals who have experienced a trauma (such as PTSD patients, see Roszell, McFall, & Malas, 1991), avoidance of traumatic memories is accompanied by high levels of disturbing intrusive memories (e.g., Kuyken & Brewin, 1994; McFarlane, 1988; Reynolds & Tarrier, 1996), suggesting that avoidance or thought suppression may enhance intrusive memory. All in all, these findings support the idea that thought suppression makes thoughts or memories hyperaccessible (Wegner & Erber, 1992). In contrast, some clinicians (e.g., Terr, 1993) argue that thought suppression may undermine episodic memory, that is, may produce psychogenic amnesia. By this view, traumatised individuals may engage in a dissociative encoding style which, in turn, may foster cognitive avoidance of disturbing memories and, thus, impair memory for traumatic events (but see McNally, Metzger, Lasko, Clancy, & Pitman, 1998).

In a recent article, Wegner, Quillian, and Houston (1996) claim to have found experimental evidence for a negative effect of thought suppression on the accuracy of episodic memory. Participants in their experiments were shown a short film and then were assigned to three conditions: a suppression condition in which participants had to suppress thoughts about the film, an expression condition in which participants were encouraged to think about the film, and a no-instruction control group. Five hours later, participants' memories of the film were tested. While the three groups did not differ in terms of the number of film details that they remembered, participants in the suppression condition had poorer recollection of the sequence of the film scenes than either expression or control participants. Suppression also affected meta-memory representations of the film in that compared to expression and control participants, suppression participants thought more of the film as a collection of isolated pictures. Wegner et al. (1996) conclude that "... participants who suppressed the film were more likely than others to report their memories of the film as having the character of snapshots rather than of moving film ..." (p. 688). As to the interpretation of their findings, Wegner et al. argue that suppression of individual memory items (e.g., certain film scenes) enhances the accessibility of these items, thereby undermining the associative links of these items to other items. That is, suppression turns certain elements into

"snapshots" and this compromises memory of temporal order. This line of reasoning is attractive because it combines the paradoxical effect of thought suppression documented in experimental studies with the amnestic power of thought suppression reported by some clinicians.

The present study further examined the effects of suppression on the accuracy of episodic memory. The experiment differed from the Wegner et al. (1996) study with respect to the film fragments that were used. Wegner et al. relied on a film about a crash between a union and a company (exp. 1), and a film about a stuntman (exp. 2). These fragments were selected because they were "interesting but nontraumatic" (p. 682). To enhance ecological validity, the present study employed an emotional film fragment. Such a fragment was chosen to investigate whether thought suppression has the effect of damaging sequence memory for negative emotional events. After all, clinicians' claim that thought suppression has an inhibitory effect on memory pertains to cases in which individuals experienced highly aversive events.

Method

Participants

Participants were 50 healthy undergraduate volunteers (43 women). Their mean age was 20.8 years (range: 18-29 years). They participated in return for a small financial compensation. They were assigned to the suppression condition (n = 26) or the no-instruction condition (n = 24).

Procedure

Participants were shown a 3-minute film clip, in classes of approximately 10 students. The film fragment was about a tourist who was attacked by a grizzly. The fragment started with some landscapes, then showed the climax (i.e., the attack), and ended with some ambiguous scenes, in so far that it remains uncertain whether the tourist survives the attack. Thus, there was a straightforward chronology. Pilot research showed that this particular film clip was evaluated as emotional and fairly aversive (Brekelmans, 1995). The above described film fragment was selected because of its emotional and realistic nature. The fragment was derived from a "Faces of Death" video. This video contained accidentally recorded film fragments of real life, traumatic events. After the film had been shown, participants were asked to return to the laboratory five hours later. Participants in the suppression condition were instructed not to think of the film, that is, to avoid any thoughts about the film. Participants in the control condition received no further instructions. In the afternoon session, all participants were asked to complete a questionnaire about the film.

Measures

The questionnaire consisted of 48 items, addressing various topics. To begin with, participants were asked an open-ended question about the number of times they had thought about the film fragment ("How many times did you think about the film, during the past 5 hours?"). They were further asked 4 questions about their emotional evaluation of the film (e.g., "How shocking was the film, according to you?"). Participants answered these questions using

100 mm Visual Analogue Scales (VASs), ranging from 0 (e.g., *not at all*) to 100 (e.g., *extremely shocking*).

The remaining 43 items concerned participants' memories of the film. Of these, 15 questions were about details of the film (e.g., "Did the deer walk from left to right, or from right to left?") and 12 were about the chronology of the film scenes (e.g., "In the film two animals were shown, a deer and a grizzly. Which animal was shown first?"). These questions were open-ended. For each correct answer, participants received one point. Accordingly, high scores on the detail and chronology scales indicate good memory. Furthermore, there were 14 meta-memory items. These items asked participants how they experienced their memory of the film in terms of VASs. Some meta-memory items were derived from the Memory Characteristics Questionnaire, described by Johnson, Foley, Suengas, and Raye (1988). In accordance with Johnson et al.'s factor analysis, the meta-memory items used in the present study tapped the following categories: clarity (8 items addressing clarity, colourfulness, detailedness, and vividness, e.g., "How vivid is your memory for the film?"; 0 = *not at all*; 100 = *very much*), context (4 items, e.g., "My memory for the place where the event took place is:" 0 = *vague*; 100 = *clear*), and intensity (2 items, e.g., "I find the story:" 0 = *very unlikely*; 100 = *very likely*). The questionnaire concluded with two items concerning the degree to which participants' internal representation of the film might be fragmented (e.g., "Thinking about the film, I see"; 0 = *isolated film scenes*; 100 = *a moving film*).

Results

Participants in the suppression condition reported more thoughts about the film fragment than participants in the control condition. Mean scores were 3.5 (SD = 2.6) and 2.1 (SD = 1.7), respectively ($t[48] = 2.3$, $p = .03$). Participants in the suppression condition evaluated the film clip as less aversive than participants in the control condition, mean scores being 207.2 (SD = 69.2) and 271.2 (SD = 62.8), respectively: $t(48) = 3.4$, $p = .001$.

Table 4.2.1 *Mean scores (standard deviations are given between parentheses) on the various memory items of suppression participants (n = 26) and control participants (n = 24).*

Scale (range)	Suppression group		Control group
Detail memory (0-15)	7.7 (2.1)		7.3 (2.1)
Sequence memory (0-12)	7.4 (1.5)		7.3 (1.6)
Meta-memory questions			
clarity (0-800)	551.6 (89.6)	*	476.1 (125.2)
context (0-400)	224.3 (66.6)		219.4 (71.9)
intensity (0-200)	60.0 (30.8)		74.0 (40.4)

Note. * $p < .05$.

Table 4.2.1 shows mean scores of the two groups on the various memory components. Both groups scored highly similar on detail and chronology questions (both $ts[48] < 1.0$). Of the meta-memory items, the clarity scale showed a difference between the two groups in that suppression participants rated their memory of the film as more clear, detailed, vivid and so on than

control participants: $t(48) = 2.5$, $p = .02$. There were no differences between the two groups with regard to context ($t[48] < 1.0$) and intensity items ($t[48] = -1.4$, $p = .17$). Suppression participants were not more likely to think of their memory of the film in terms of snapshots than were control participants. If anything, the opposite was true: mean scores were 103.0 ($SD = 46.2$) and 80.0 ($SD = 51.1$), respectively: $t(48) = 1.7$, $p = .10$.

Discussion

The main results of the present study can be summarised as follows. First, in line with previous findings (e.g., Wegner et al., 1987), suppression participants reported a higher frequency of the target material than control participants. Second, suppression participants evaluated the film as less aversive than control participants. Third, suppression did not affect detail memory, nor did it affect memory for chronological order. The latter finding is in contrast with the results reported by Wegner et al. (1996). Fourth, suppression did have consequences for the meta-memory judgements in that suppression participants evaluated their memory of the film as being more clear, detailed, vivid and so on compared to controls.

How can this pattern of results be explained? The paradoxical effect of thought suppression may account for, at least, some of the results. Since suppression participants had thought of the film more frequently during the day, they may have experienced their memory of that film as more familiar and, consequently, as less emotional, but more clear. However, these effects were restricted to the meta-memory domain, since suppression did not affect memory for details or memory for sequence of the film.

The current study failed to find evidence for the idea that suppression undermines memory for sequence of an episode, nor did it confirm the claim that suppression results in a fragmented (snapshot like) representation of an episode. One reason for the differences between the current results and those presented by Wegner et al. (1996) might be the measures that were employed in both studies. Wegner et al. obtained various measures, such as free recall, cued recall, clip ordering, and clip recognition. For the content questions, they mainly relied on cued recall items, while sequence memory was mainly assessed through the ordering of film clips. Clip ordering showed a significant difference in the first experiment of Wegner et al. with the suppression group exhibiting a poorer performance on this measure than the other groups. Surprisingly, in the second experiment, the clip ordering measure showed no differences between groups, when this assessment followed a free recall test. Perhaps, then, these various memory measures interact and differ in their sensitivity. In contrast, the present study used only one type of memory index, namely cued recall measures. Another possible reason for our failure to replicate Wegner et al.'s findings may be found in the nature of the suppressed material. The film clips used by Wegner et al. were emotionally neutral and had a duration of approximately 10-35 minutes. The present study relied on an aversive 3-minute clip. Obviously, longer episodes possibly have more complex chronologies. Thus, it may well be the case that suppression effects on

memory for sequence become only evident with complex material. However, this explanation seems unlikely given the fact that the relatively short film, that was used in the current study, appeared to contain enough chronology for participants to forget some of it: mean scores on the chronology scale were 7.4 for suppression participants, and 7.3 for controls, with the maximum score being 12. Therefore, our failure to find distortions in sequence memory is not likely to be ascribed to the simplicity and short duration of the film fragment. There is another, theoretically more interesting reason for our failure to replicate Wegner et al.'s findings. Whereas Wegner and associates employed neutral material, the present study used aversive stimulus material. As mentioned previously, this film was chosen because in daily life, suppressed material will mostly be of an aversive nature. Possibly, the emotional value of memories modulates the effects of suppression. One could argue that emotional memories are more accessible and, therefore, less easily undermined by suppression. While such an interpretation is difficult to reconcile with clinical descriptions about the amnestic power of suppression of traumatic memories (e.g., Terr, 1991), it is in line with studies on so called "flashbulb memories" (e.g., Conway et al., 1994). In general, these studies show that details surrounding an important event can be retrieved easily.

A final remark pertains to how memory effects of suppression fit into the thought suppression literature. There is abundant evidence that thought suppression results in an increased frequency of the to-be-suppressed material (i.e., the "white bear" effect). Note that Wegner et al.'s (1996) findings deviate from this pattern. That is, in both their experiments, suppression participants did not report a higher frequency of thoughts about the film, than control participants. The findings in the current study are in line with the well documented white bear effect: suppression participants reported more thoughts about the film, than control participants. It is not clear how to reconcile these conflicting results. Therefore, future studies on thought suppression should examine how the paradoxical effect is related to memory effects, and under what circumstances suppression leads to memory enhancement or distortion.

4.3 Thought suppression, memory, and interrogative suggestibility

Eric Rassin [7]

Psychology, Crime, and Law, in press

Abstract

Experimental studies often demonstrate that thought suppression (i.e., consciously trying to avoid having certain thoughts), paradoxically, leads to hyperaccessibility of the to-be-suppressed thought. On the other hand, thought suppression has been claimed to possess memory undermining qualities. The present study sought to investigate the potential memory undermining effect of thought suppression. Thereto, the Gudjonsson Suggestibility Scale (GSS; Gudjonsson, 1984; *Personality and Individual Differences*, *5*, 303-314) was administered to 56 undergraduate students. Participants were appointed to one of three conditions: a suppression condition (n = 20), a thinking condition (n = 19), and a no-instruction control condition (n = 17). The memory performance and suggestibility tendencies of the three groups were compared. Results indicate that thought suppression has little or no influence on episodic memory or suggestibility. More specifically, thought suppression resulted in decreased accuracy of free recall compared to thinking, but not compared to no-instruction control.

[7] Thanks to Peter Muris and Harald Merckelbach for their help in conducting this study.

Thought suppression refers to the process of consciously trying to avoid certain thoughts. Clearly, thought suppression is likely to occur when unpleasant and unwanted thoughts intrude consciousness and, thus, this coping strategy is seen in patients with psychopathological syndromes in which unwanted intrusions play a crucial role. For example, thought suppression is a frequently reported reaction to intrusions in patients with Obsessive-Compulsive Disorder (OCD), Acute Stress Disorder (ASD), and Post Traumatic Stress Disorder (PTSD; see, for a review, Rassin, Merckelbach, & Muris, in press). Generally, thought suppression seems to have counterproductive effects, in that the to-be-suppressed thought comes to intrude consciousness more in stead of less often (Wegner, Schneider, Carter, & White, 1987). Wegner and Erber (1992) refer to this phenomenon as the "hyperaccessibility" effect. When the to-be-suppressed thought pertains to autobiographical memory, as is the case in ASD or PTSD, the potential effects of thought suppression on episodic memory become of interest. With the well documented hyperaccessibility phenomenon in mind, one may argue that the effect of suppression on memory, if any, is likely to be that the memory trace of the suppressed thought actually strengthens. On the other hand, some authors argue that continually trying to expel thoughts from consciousness may actually result in (dissociative) amnesia (e.g., Terr, 1993).

Recently, Wegner, Quillian, and Houston (1996) experimentally investigated the effects of thought suppression on memory. These authors showed the participants in their study a short film clip of approximately 10 minutes. Then, participants were appointed to one of three conditions: a suppression condition in which participants were instructed not to think of the film during the rest of the day, a thinking condition in which participants were instructed to think as much as possible about the film clip, and a no-instruction control condition. Five hours later, all participants' memories of the film clip were tested. Results indicated that participants in the suppression group performed worse on questions pertaining to the chronology of the film than did participants in the other two groups. Furthermore, suppression participants experienced their memory as being more fragmented and snapshot like as compared to other participants. These results led Wegner et al. (1996) to conclude that thought suppression has a (partial) amnestic potential: "The snapshot effect of suppression suggests that people might indeed do something that resembles the effect attributed to classical repression" (p. 689). As to the explanation of their findings, the authors speculated that suppression attempts may have made certain discrete film fragments hyperaccessible. This specific hyperaccessibility effect may then have overshadowed the sequence overall memory. Thus, Wegner et al. (1996) succeed in reconciling the hyperaccessibility effect of thought suppression as found in experimental studies with the amnestic effect claimed by several clinicians. Using an experimental design similar to that of Wegner et al. (1996), Rassin, Merckelbach, and Muris (1997) failed to find a memory undermining effect of thought suppression. However, these authors did find a hyperaccessibility effect. That is, suppression participants reported to have more thoughts about the film fragment than controls. Rassin et al. (1997) argue that the conflicting results between the two studies may be attributed to

the nature of the employed film clips. Whereas Wegner et al. (1996) used a neutral film, the study by Rassin et al. (1997) relied on an emotional film fragment. It may well be the case that the memory effects of thought suppression are influenced by the emotional valence of the to-be-suppressed material.

Although the memory undermining potential of thought suppression has so far mainly been discussed in the light of pathological conditions such as PTSD, this issue is also highly relevant to other contexts such as police interrogation. Regardless of the emotional valence of the memory, witnesses to a crime may engage in cognitive avoidance strategies before being questioned by the police. If thought suppression is proven to undermine memory, this is of relevance to the fact finding process to which police interrogation should contribute. Note that Wegner et al. (1996) found memory undermining effects after no longer than five hours of suppressing thoughts. The present study sought to further investigate the effects of thought suppression on episodic memory. The Gudjonsson Suggestibility Scale (GSS; Gudjonsson, 1984, 1997) was used as stimulus material. The GSS was introduced as a measure of interrogative suggestibility, but this scale also provides information about memory. The GSS is administered as follows. First, a short story is read to the respondent. Next, the respondent is asked to reproduce the story as accurately as possible. This free recall test can take place immediately and/or after a delay period. After this, the respondent is asked a set of 20 questions about the story, 15 of which are leading in that they imply information that was not in the original story. Following this, the interrogator retreats briefly and returns to tell the respondent that he/she made several mistakes and, therefore, must answer all questions once more. Administered in this way, the GSS renders information about memory and confabulation. Furthermore, the tendency to accept post-hoc misinformation can be expressed by summing the number of times that the respondent gives in to leading questions during the first questioning. This number can range from 0 to 15 and is referred to as the "yield" score. The number of changed answers during the second round as compared to the first is referred to as "shift". The shift score ranges from 0 to 20 and is thought to indicate the extent to which the respondent is susceptible to social pressure. A total suggestibility score can be computed by summing up the yield and shift score. Consequently, total scores range from 0 to 35. The psychometric qualities of the GSS have been proven to be satisfactory (Gudjonsson, 1992; Merckelbach, Muris, Wessel, & Van Koppen, 1998), and, thus, this scale can be considered a standardised measure of memory and suggestibility. Apart from the fact that the GSS provides a good memory index, there was a second reason to use this scale to investigate the effects of thought suppression on memory. Note that, according to the "trace strength hypothesis" (see Coxon & Valentine, 1997), decreased memory is likely to be accompanied by increased suggestibility. The reason for this may be that a poor memory hinders the detection of discrepancies between misleading information and the original event. Given this hypothesised relationship, thought suppression may not only have memory undermining effects, but may consequently also increase

suggestibility. In the present experiment, the effects of thought suppression on memory and suggestibility were investigated by administering the GSS to a sample of 56 undergraduate students. Participants were randomly assigned to one of three conditions: a suppression condition, a thinking condition, and a no-instruction control condition.

Method

Participants

Female undergraduate psychology students (N = 56) participated in the experiment. Mean age in the sample was 18.6 years (SD = .89; range: 17-22 years). Participants were appointed to one of three conditions: a suppression condition (n = 20), a thinking condition (n = 19), and a no-instruction control condition (n = 17). All participants were tested individually.

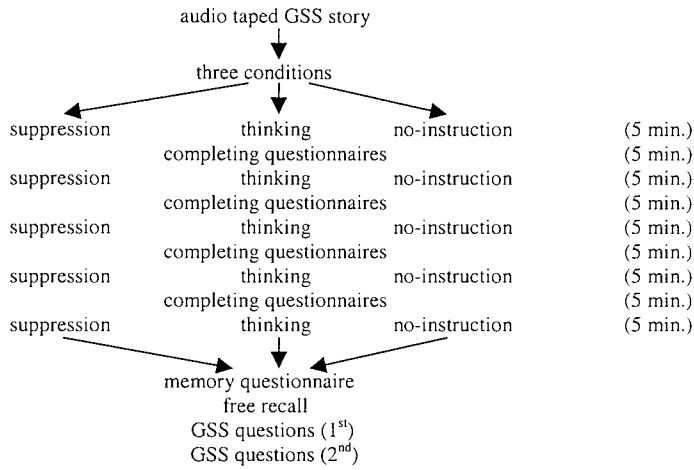
Procedure

Upon arrival at the laboratory, an audio taped version of the GSS story was played to the participants. After this, participants in the suppression condition were instructed as follows: "During the next few minutes you are free to think about anything you want to. However, there is one exception: you must try not to think about the story. If thoughts about the story come into consciousness, you should use any means necessary to make them go away. What you should do, is comparable to what you might be tempted to do if you found out bad news just before a test. You would try to push that bad news out of your mind during the test. That is exactly what I would like you to do with every thought of the story - if any - for the next few minutes. Furthermore, I would like you to score every time - if any - you do think of the story, on this piece of paper". Participants in the thinking condition were given the following instruction: "During the next few minutes I would like you to think as much as possible about the story. You should think as long and as often about it as you can. What you should do, is comparable to what you might be tempted to do if you were planning a party. You would constantly go over every detail of that party, you would think of the guest list and of your shopping list. Likewise, you must think constantly about the story during the next few minutes. Go over it again and again. Furthermore, I would like you to score every separate time you think of the story, on this piece of paper". Participants in the no-instruction control condition were told: "During the next few minutes you are free to think about anything you want to. You may think of the story, or of anything else. What is important, is that I would like you to score every time - if any - you think of the story, on this piece of paper".

After participants had spent 5 minutes alone in the laboratory, the experimenter returned and said that the next 5 minutes would be filled with completing questionnaires. During these 5 minutes, the instructions given before were not applicable. After this, the following 5 minutes were, again, spent suppressing, thinking, or without further instruction, respectively. All in all, participants underwent 5 times 5 minutes in the laboratory during which the experimental instruction had to be carried out. The 4 intervals between these 5-minute periods were filled with completing questionnaires irrelevant to the

present study. This procedure was chosen for two reasons. First, separate periods of suppression are more likely to occur in real life than are continuous suppressing episodes. Second, these 5-minute periods were thought to prevent participants from loosing concentration. Furthermore, this procedure enabled the experimenter to repeat the instructions at the beginning of every experimental period. After thus having spent 45 minutes, participants were asked a few questions pertaining to their memory of the story (see below) and were instructed to write down the story as literally and accurately as possible (free recall). Immediately after this was done, the 20 questions of the GSS were asked for the first time. The experimenter, then, inspected the answers and summoned the participant to answer all questions for a second time. Figure 4.3.1 provides a schematic overview of the experimental procedure.

Figure 4.3.1 *Schematic overview of the experimental procedure.*



Materials

The post-experimental questionnaire that was construed for the purpose of the present study contained four questions. Participants in the suppression condition and control condition were first asked to what extent they had tried to suppress thoughts about the film. This question had to be answered on a 10-pointscale (1 = *not at all*; 10 = *very strongly*). All participants were asked to what extent they thought of the content of the story as unpleasant (1 = *absolutely not unpleasant*; 10 = *very unpleasant*). Participants were also asked to estimate the accuracy of their memory of the story (1 = *very inaccurate*; 10 = *very accurate*). Lastly, respondents had to describe whether they now thought of the story as a fluent coherent whole, or, rather, as a collection of isolated details, snapshots (1 = *snapshots*; 10 = *fluent whole*).

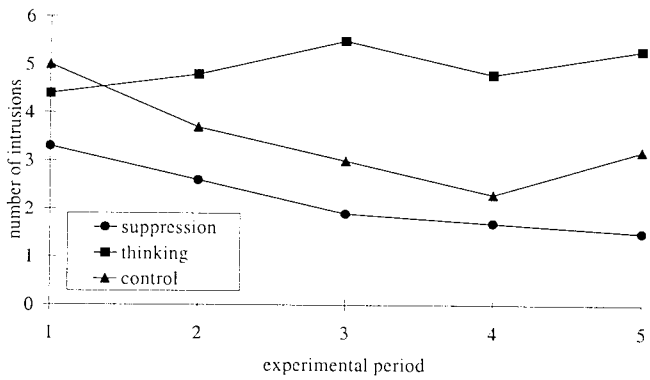
The GSS was scored as follows. First, the number of correctly reproduced details during free recall was calculated. The maximum score is 40 (Gudjonsson, 1984, 1997). Second, the extent to which participants confabulated during free recall was analysed. In accordance with previous

studies (e.g., Clare, Gudjonsson, Rutter, & Cross, 1994; Smith & Gudjonsson, 1995), confabulation was defined as the sum of distortions and fabrications. A distortion can be defined as "a change in the details of an idea in the story, or the substitution of an idea from one part of the story to another" (Smith & Gudjonsson, 1995, p. 518). Smith and Gudjonsson (1995) define a fabrication as an "entirely fresh idea that was neither mentioned nor obviously implied in the story" (p. 518). One point was scored for every distortion or fabrication. Apart from these free recall measures, the yield scale (range: 0-15), the shift scale (range: 0-20), and the total score (range: 0-35) were used. It should be noted that for the shift scale one point was scored for every changed answer, regardless of whether the change pertained to a leading or a non-leading question and regardless of whether the change was actually a correction.

Results

Participants in the suppression group reported greater effort to suppress story-related thoughts than control participants, mean scores being 5.5 (SD = 2.4) and 4.0 (SD = 2.0), respectively: $t(35) = -2.0$, $p < .05$. The number of story-related intrusions was analysed by means of a 3 (groups) x 5 (experimental periods) analysis of variance with repeated measures on the last variable (MANOVAR), which yielded both a group ($F[2] = 5.8$, $p < .01$) and a period effect ($F[4,50] = 3.9$, $p < .01$). Furthermore, there was a significant group x period interaction: $F(4,50) = 3.2$, $p < .01$. Figure 4.3.2 displays the number of intrusions in the three groups.

Figure 4.3.2 Mean number of story-related intrusions in the suppression (n = 20), thinking (n = 19), and control (n = 17) group.



As to the rating of unpleasantness, there were no group differences. Suppression, thinking, and control participants evaluated the story as fairly neutral, mean scores being 2.2 (SD = 1.1), 2.9 (SD = 1.7), and 2.9 (SD = 2.2), respectively ($F[2,53] = 2.5$, $p = .28$). Neither was there a difference in the estimated accuracy of participants' own memories of the story. Participants in the suppression, thinking, and control group scored 5.9 (SD = 1.4), 5.6 (SD =

1.5), and 5.4 (SD = 1.9), respectively: $F(2,53) < 1.0$. With respect to the mental representation of the story, there was a group difference ($F[2,53] = 4.4$, $p < .05$). Post-hoc analysis revealed that this difference was caused by the fact that suppression participants (M = 3.5, SD = 1.7) evaluated their mental representation of the story as more snapshot like than did participants in the thinking group (M = 5.6, SD = 2.3). Controls scored in between (3.9, SD = 3.0). The scores on the various GSS measures are summarised in Table 4.3.1. As can be seen in this table, scores hardly differed between groups. The only difference pertained to the number of correctly reproduced details. That is, participants in the suppression group scored worse on this measure than participants in the thinking group.

Table 4.3.1 *Mean scores (and standard deviations) of suppression (n = 20), thinking (n = 19), and control (n = 17) participants on the various GSS measures.*

	Suppression	Thinking	Control
Correctly recalled details	14.4_a (4.2)	18.5_b (3.6)	15.6_{ab} (4.8)
Confabulations	11.2 (3.0)	12.8 (4.5)	12.1 (4.1)
distortions	7.7 (2.9)	8.8 (3.3)	9.0 (2.7)
fabrications	3.5 (1.9)	4.0 (2.5)	3.1 (2.1)
Yield	3.7 (2.5)	2.6 (1.5)	3.6 (2.5)
Shift	4.7 (2.8)	4.3 (2.1)	4.4 (3.0)
Total GSS score	8.4 (3.3)	6.9 (2.6)	8.0 (4.6)

Note. *Means in the same row that do not share subscripts differ at p < .01 in the Tukey honestly significant difference comparison.*

Lastly, several Pearson product-moment correlations were calculated (N = 56). The number of correctly reproduced details correlated negatively with the number of fabrications (r = -.28, $p < .05$), with the yield scale (r = -.39, $p < .01$), and with the total GSS score (r = -.41, $p < .01$). The number of reported intrusions was not correlated with any of the GSS measures.

Discussion

The results of the present study can be summarised as follows. First, participants who were given instructions to suppress thoughts about the GSS story reported fewer intrusions about that story than did participants in the other groups. Second, there was a difference between suppression and thinking participants with respect to the meta-memory characteristic of the story. That is, participants in the suppression group experienced their own memory as being more fragmented, snapshot like than did participants in the thinking group. Third, as to the effects on memory, suppression, compared to thinking, depressed the free recall performance. Confabulation was not affected by the instructions. Effects were also absent with respect to suggestibility.

In sum, thought suppression seemed to have little effect on episodic memory. The found memory undermining effects of suppression (i.e., perceived snapshot likeness and decreased free recall) became only evident when suppression participants were compared to thinking participants. When compared to the no-instruction control condition, suppression did not exhibit

memory undermining effects. This is in line with the finding that thought suppression failed to increase suggestibility, although there was a correlational relationship between memory and suggestibility (cf., trace strength hypothesis). Interestingly, in a previous study, avoidance coping strategies (of which thought suppression is an example) were found to be correlated with suggestibility (Gudjonsson, 1992). However, in that study, the effects of coping strategies during interrogation were examined, while the present study focused on pre-interrogation coping styles.

Though the magnitude of the effects observed in this study was small, the current results are reminiscent of those reported by Wegner et al. (1996), although the memory undermining effects found by these authors specifically pertained to sequence memory. By contrast, Rassin et al. (1997) reported that suppression had no memory undermining effects. This contradiction may be attributed to the emotional valence of the used target materials. Whereas our previous study employed an emotional film clip, the stimulus in the present study, as well as that in the study by Wegner et al. (1996) were fairly neutral. In short, there is little evidence to suggest that suppression results in enhanced forgetting, and if suppression does have a memory undermining potential, this seems to apply more to neutral than emotionally laden memories. This idea is indirectly supported by the absence of a paradoxical increase in story-related intrusions, after suppression instructions, both in the current study and in the Wegner et al. (1996) experiment, whereas such an increase was present in the study by Rassin et al. (1997). Indeed, there is evidence to suggest that emotionally laden target thoughts promote the occurrence of paradoxical increases in intrusions after suppression instructions (e.g., Petrie, Booth, & Pennebaker, 1998).

The pattern of results found in this study (i.e., thought suppression resulting both in less intrusions and poorer memory compared to thinking) may give rise to the conclusion that the effects of suppression can readily be explained by a lack of rehearsal. However, the absence of a correlation between the number of intrusions and the amount of correctly recalled details contradicts this explanation. Apparently, then, another mechanism is involved.

As to the implications of the current results, it should be noted that thinking (i.e., rehearsal) of a witnessed event may be a more fruitful coping strategy than suppressing thoughts about the event. The current findings suggest that thinking results in the reproduction of more details during free recall compared to suppression. These results pertain to neutral, or at least less emotional memories and should not be extrapolated to highly emotional events (as seen in PTSD). Given that the effects of suppression versus thinking were present after no longer than 50 minutes, the results emphasise the necessity of interviewing witnesses and suspects immediately after the crime or accident. Also, witnesses should be discouraged from engaging in cognitive avoidance strategies.

4.4 Thought suppression and traumatic intrusions in undergraduate students: A correlational study

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Personality and Individual Differences, in press

Abstract

Thought suppression (i.e., the process of consciously trying to avoid certain thoughts) is claimed to promote memory loss, but also to increase the frequency of intrusive thoughts (i.e., hyperaccessibility). Although these effects seem contradictory, Wegner, Quillian, and Houston (1996; *Journal of Personality and Social Psychology*, *71*, 680-691) succeeded in reconciling them by postulating the "scene activation" hypothesis. According to this hypothesis, hyperaccessibility of isolated intrusive memories, due to thought suppression, leads to perceived fragmentation (i.e., snapshot likeness) of the memory of the whole event, ultimately resulting in a perception of (partial) memory loss. To investigate this chain of events, undergraduate students (N = 110) completed questionnaires about thought suppression and their memories of highly adverse experiences. Correlational analyses revealed that thought suppression was positively related to hyperaccessibility, snapshot likeness, and memory loss. Structural equation modelling elucidated that thought suppression is not necessarily the cause of these memory characteristics.

In clinical literature, thought suppression refers to conscious attempts to avoid certain thoughts (e.g., Wegner, Schneider, Carter, & White, 1987). Obviously, such attempts play a major role in psychopathological conditions that involve recurrent intrusions (see, for a review, Purdon, 1999). For example, people suffering from Post Traumatic Stress Disorder (PTSD; American Psychiatric Association, 1994) commonly report to engage in thought suppression whenever trauma memories intrude their consciousness (e.g., Amir, Kaplan, Efroni, Levine, Benjamin, & Kotler, 1997).

There is some dispute as to the precise effects of thought suppression (see, for a review, Rassin, Merckelbach, & Muris, in press). Some authors argue that thought suppression is a counterproductive defence strategy that produces more rather than fewer thoughts about the to-be-suppressed topic (Wegner et al., 1987). By this view, thought suppression induces a state of "hyperaccessibility" of intrusion-linked material (Wegner & Erber, 1992). Other researchers claim that thought suppression may be quite successful and may result in rapid decline (or dissociative amnesia) of suppressed information (e.g., Brewin & Andrews, 1998; Terr, 1993).

Interestingly, a recent laboratory study on suppression and episodic memory by Wegner, Quillian, and Houston (1996) found some supporting evidence for the idea that thought suppression may produce both hyperaccessibility and memory undermining effects (but see Rassin, Merckelbach, & Muris, 1997). In that study, students were exposed to a neutral film clip and were subsequently assigned to one of three conditions: a suppression condition in which students were instructed not to think about the film clip during the remainder of the day, a thinking condition in which students were told to think as much as possible about the film clip, and a no-instruction control condition. Five hours later, students returned to the laboratory and were given a memory test covering several aspects of the film clip. Suppression was found to result in a poor memory of event chronology as well as in an altered perception of one's own memory. More specifically, compared to participants in the others conditions, suppression participants more often described their memory of the film clip as a collection of isolated snapshots rather than a moving film. Wegner et al. (1996) argue that this snapshot effect (i.e., the loss of sequence memory) may lead people to experience (a specific form of) memory loss. In their words, "the snapshot effect of suppression suggests that people might indeed do something that resembles the effect attributed to classical repression" (Wegner et al., 1996, p. 689). Discussing these findings, they succeed in reconciling the memory undermining snapshot effect with the well documented paradoxical hyperaccessibility effect of thought suppression. According to their "scene activation" hypothesis, it is not the complete memory of the trauma that intrudes consciousness, but rather specific scenes - probably the most emotional and impressive ones. These specific scenes would then become the targets of suppression attempts. This, in turn, would lead to hyperaccessibility of these scenes, but would also compromise overall (sequence) memory of the event. Thus, the hyperaccessibility effect may lead people to experience intense

intrusive memories pertaining to specific scenes, but, at the same time, may result in a perception of declined memory of the event as a whole.

So far, studies in this domain have been preoccupied with the effects of thought suppression on the frequency of unpleasant intrusions. However, it may well be the case that thought suppression also affects the intensity of such intrusions. For example, the hyperaccessibility of traumatic intrusions may, in some cases, result in the development of exaggerated intrusions. Germane to this issue is a study by Merckelbach, Muris, Horselenberg, and Rassin (1998) who found that 22% of the respondents with traumatic recollections experienced their traumatic intrusions as exaggerations ("worse case scenarios") of the original event. This finding is, of course, difficult to reconcile with the popular notion that intrusive traumatic memories (i.e., flashbacks) are veridical copies of the original trauma (e.g., Van der Kolk & Fisler, 1995). In discussing these results, Merckelbach et al. (1998) speculated that thought suppression may (through its paradoxical hyperaccessibility effect) promote the process of enlargement of traumatic intrusions.

Interestingly, in clinical literature, traumatic memories have been characterised as both more and less intense than neutral memories. For example, in a study of Ward and Caroll (1997), victims of sexual assault described their traumatic memories as showing enhanced vividness. In contrast, Koss, Figueredo, Bell, Tharan, and Tromp (1996) reported reduced vividness and clarity of traumatic memories in their sample of rape victims. Possibly, this variety in the phenomenal characteristics of traumatic intrusions has to do with the type of post-trauma elaboration that patients engage in, that is, whether or not they rely on thought suppression.

The current study examined the relationship between thought suppression and the characteristics of traumatic intrusions, by analysing questionnaire data. According to Wegner and Zanakos (1994), there are individual differences in the extent to which people rely on thought suppression as a means to deal with unpleasant thoughts. Some people may engage in thought suppression quite regularly. Therefore, the tendency to cope with unwanted thoughts by suppressing them can be measured. Wegner and Zanakos (1994) introduced the White Bear Suppression Inventory (WBSI) as a measure of chronic thought suppression and concluded that suppression, indeed, is a stable defence mechanism. In their words: "... self-reports of thought suppression are reliable over time and thus fulfill an important criterion for recognition as a trait" (Wegner & Zanakos, 1994, p. 624). Undergraduate students completed the WBSI and a questionnaire about their most traumatic experience in the past 2 years. It was hypothesised that thought suppression is related to the intensity of trauma-related intrusions (hyperaccessibility effect) as well as to perceived snapshot likeness of traumatic memory (memory undermining effect).

Method

Participants

A sample of 110 undergraduate psychology students (81 women) volunteered to participate in the study. Mean age was 19.7 years (*SD* = 1.9; range: 18-31). Students received a small financial compensation for their participation.

Measures

Participants completed two questionnaires. First, the White Bear Suppression Inventory (WBSI; Wegner & Zanakos, 1994; see also Muris, Merckelbach, & Horselenberg, 1996) was completed. The WBSI comprises 15 items that tap the tendency to suppress unwanted thoughts (e.g., "I always try to put problems out of mind"). Items are answered on a 5-pointscale (1 = *strongly disagree*; 5 = *strongly agree*). A total score can be calculated by summing across items (range: 15-75), with higher scores indicating a stronger tendency to engage in thought suppression. [8]

The second questionnaire was developed for the purpose of the present study. This questionnaire contained 10 items addressing respondents' memory of a relatively recent traumatic experience. The first item invited respondents to describe briefly the most traumatic event they had experienced over the past 2 years. The reported traumas did not have to satisfy the DSM-IV criteria for PTSD (i.e., experiencing, witnessing, or being confronted with an event that involved actual or threatened death or serious injury, or a threat to the physical integrity of oneself or others), but, rather, had to be experienced as traumatic. The next 6 items pertained to typical hyperaccessibility characteristics of traumatic intrusions in the weeks after the incident and were adopted from the Merckelbach et al. (1998; see also VanOyen Witvliet, 1997) study. These items were answered by means of 100 mm Visual Analogue Scales (VASs), and addressed the frequency of intrusions (0 = *never*; 100 = *all the time*), controllability (0 = *completely controllable*; 100 = *completely uncontrollable*), emotionality (0 = *not at all emotional*; 100 = *extremely emotional*), accompanying bodily sensations (0 = *not at all*; 100 = *very much*), whether or not the respondent had dreamt about the incident (0 = *never*; 100 = *very frequently*), and correspondence between the content of the intrusion and the original event (0 = *the intrusion is a paler version*; 100 = *the intrusion is an exaggerated version*). In accordance with the Merckelbach et al. (1998) study, these items were collapsed into an "overall hyperaccessibility" variable (α = .83). The next three items pertained to respondents' present-day memory of the traumatic incident. Thus, one item asked to what extent the respondent still had traumatic intrusive thoughts (0 = *never*; 100 = *all the time*). A second item asked respondents to indicate whether their memory of the incident was fluent or rather a compilation of isolated snapshots (0 = *fluent*; 100 = *snapshots*). Lastly, they were asked if there had ever been a period in which they had

[8] It has been argued that 5 WBSI items (e.g., "I have thoughts that I cannot stop") pertain to loss of mental control rather than thought suppression per se (see Muris et al., 1996). Consequently, a corrected WBSI score can be calculated by summing across the remaining 10 items. Analyses in the present study were run with both total WBSI scores and corrected WBSI scores. As these analyses yielded similar results, findings based on the total WBSI scores are presented.

experienced memory loss with respect to the incident (0 = *not at all*; 100 = *I experienced such memory loss*).

Data Analysis

Data were analysed by means of simple correlations and structural equation modelling (EQS; Bentler, 1989). EQS produces several goodness-of-fit indices indicating how well the tested model accounts for the observed correlational structure of the data. In the present study, the following indices were used: 1) the Chi-square (χ^2) Goodness-of-Fit value, which is required to be non-significant for the tested model to provide a good fit for the data, 2) the Average off diagonal Absolute Standardised Residuals (AASR), which should not exceed .05 in order for the model to fit the data well, 3) Akaike's Information Criterion (AIC) which is a fit index that takes into account the parsimony of the tested model (i.e., the number of included paths); AIC is a relative measure, that is, the model with the smallest number provides the best fit, and 4) the Comparative Fit Index (CFI) which compares the fit of the tested model with that of the hypothetical model in which none of the variables are correlated. A CFI of .90 or higher indicates that the tested model fits the data well (see, for an extensive discussion of these indices, Schumacker & Lomax, 1996).

Results

The types of trauma reported by respondents are listed in Table 4.4.1. As can be seen, the most frequently mentioned traumatic event involved death of a person close to the respondent (see also Merckelbach et al., 1998; Wessel & Merckelbach, 1994). It should be noted that across the different trauma types, 16.5% of the respondents reported to have been a victim (e.g., assault), 13.8% reported having been a witness to a discrete traumatic incident (e.g., accident), and 69.7% reported experiences that were of a more schematic nature and involved a longer time span (e.g., divorce of parents, being stalked, or suffering from a chronic illness). Analysis of variance (ANOVA) revealed that these three groups did not differ with respect to WBSI scores: $F(2,106) = 2.0$, $p = .15$. Additionally, results of a multivariate analysis of variance (MANOVA) revealed that there were no reliable group difference in any of the memory indices: $F(8,194) = 1.2$, $p = .27$. Given this lack of group differences, it was decided to collapse data across the different trauma types.

Table 4.4.1 *Frequency of reported traumatic events (N = 110).*

Type of event	Frequency	
Death	47	(42.7%)
Illness	15	(13.6%)
Accident	12	(10.9%)
Interpersonal conflicts	10	(9.1%)
Harassment or assault	8	(7.3%)
Breaking up a relationship	6	(5.5%)
Exposure to a phobic object	3	(2.7%)
Miscellaneous (e.g., bad drug trip)	9	(8.2%)

Mean scores and Pearson product-moment correlations are presented in Table 4.4.2. As can be seen, thought suppression correlated modestly with all memory characteristics, such that stronger suppression tendencies were related to hyperaccessibility, recent intrusions, snapshot like recollections, and self-reported memory loss. As well, several memory characteristics correlated with each other. To explore these associations in more detail, structural equation modelling was employed. The tested models were inspired by the obtained correlations and were, furthermore, limited by the following considerations. To begin with, hyperaccessibility had to precede recent intrusive memories, snapshot likeness, and temporal memory loss, since the former characteristic pertained to the weeks immediately after the incident, while the latter characteristics pertained to present-day memory. Second, thought suppression might be placed anywhere in the causal chain, because the WBSI does not specify the when and why of suppression attempts. However, we decided that WBSI scores should not be the consequence of snapshot likeness or temporal memory loss, given that such pathways would seem theoretically unlikely: there is little reason to assume that people who presently report snapshot like recollections will therefore tend to suppress such recollections. A second reason to exclude snapshot likeness and temporal memory loss - but also recent intrusive memories - as a cause of thought suppression is that thought suppression as measured by the WBSI is a rather global and stable coping strategy. By this view, it is implausible that recent memory characteristics affect the suppression tendency tapped by the WBSI.

Table 4.4.2 *Mean scores (and standard deviations) on the WBSI and on the memory characteristics variables, and correlations (N = 110).*

	Mean (*SD*)	Correlations			
		WBSI	H	RIM	SL
WBSI	42.8 (9.0)				
H	47.4 (17.0)	.21 *			
RIM	37.1 (22.4)	.17 *	.52 **		
SL	52.1 (24.9)	.24 **	-.11	.02	
TML	29.1 (25.3)	.22 *	.39 **	.36 **	.17 *

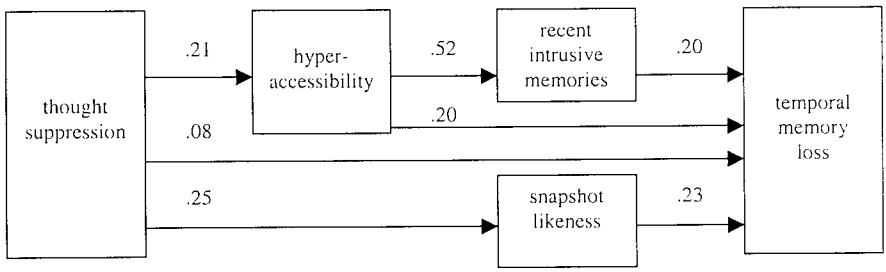
Note. *WBSI = White Bear Suppression Inventory; H = hyperaccessibility; RIM = recent intrusive memories; SL = snapshot likeness; TML = temporal memory loss.*
** $p < .05$; ** $p < .01$ (one-tailed).*

In the first model, the 4 memory characteristics are exclusively affected by the WBSI. This model had poor fit indices. That is, its χ^2-value was significant ($p < .001$), there was too much unexplained variance (> .05), and the CFI was low (< .24). Next, a model was tested in which thought suppression produces hyperaccessibility, while hyperaccessibility promotes recent intrusions, snapshot likeness, and temporal memory loss. After modifications based on results of the Lagrange Multiplier test for adding parameters and the Wald test for dropping parameters, Model 2 (shown in Figure 4.4.1) proved to provide a good fit. Basically, this model holds that thought suppression directly influences hyperaccessibility, snapshot likeness, and temporal memory loss.

However, reversal of the causal link between thought suppression and hyperaccessibility (i.e., hyperaccessibility preceding thought suppression) resulted in a third model, which produced fit indices similar to those of Model 2. Therefore, a fourth model was tested, in which thought suppression and hyperaccessibility act as relatively independent entities that are allowed to covary. This model provided the best fit indices. Fit indices for the 4 models are summarised in Table 4.4.3.

Figure 4.4.1 *Plausible pathways describing the role of thought suppression in the development of traumatic memory characteristics.*

Model 2



Note. *Model 3 consists of a reversal of the link between thought suppression and hyperaccessibility.*

Model 4

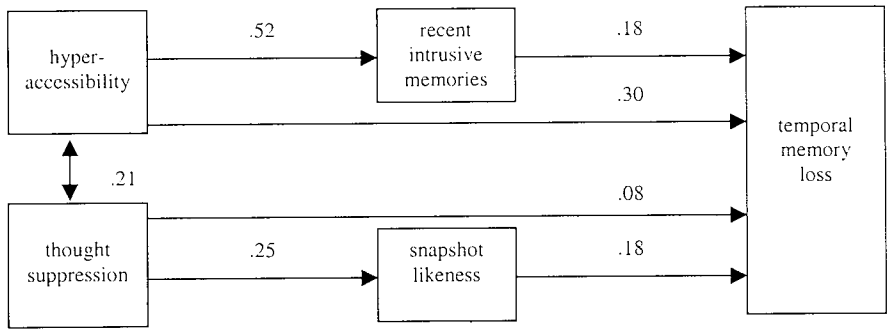


Table 4.4.3 *Fit indices for the 4 models.*

	χ^2	*p*	AASR	AIC	CFI
Model 1	56.54	< .001	.14	44.54	.24
Model 2	5.84	.12	.04	.15	.96
Model 3	5.84	.12	.04	.15	.96
Model 4	4.55	.21	.03	1.50	.98

Note. *AASR = Average off-diagonal Absolute Standardised Residuals; AIC = Akaike's Information Criterion; CFI = Comparative Fit Index.*

Discussion

The results of the present study can be summarised as follows. When asked to describe the most traumatic experience over the past 2 years, 16% of the respondents reported having been the victim in an acute traumatic event, 14% reported having witnessed a discrete traumatic event, and 70% reported traumatic experiences that involved a process rather than a single, discrete incident. As an aside, it is noteworthy that a substantial percentage of the participants in the present study indicated that in the weeks after the traumatic event, their intrusive memories had taken the form of a worse case scenario. That is, 17.4% of the participants had a score that exceeded 60 on the pertinent VAS. This finding replicates previous results (Merckelbach et al., 1998) and casts further doubts on the claim that traumatic intrusions possess photographic accuracy (e.g., Van der Kolk & Fisler, 1995). Instead, our results and those of others (Schwartz, Kowalski, & McNally, 1993; Southwick, Morgan, Nicolaou, & Charney, 1997) suggest that the content of traumatic intrusions can be influenced by post-trauma elaboration and reconstruction (e.g., Safer, Christianson, Autry, & Österlund, 1998). A case in point is a study by Bryant and Harvey (1998). These authors noted that survivors of motor vehicle accidents who suffer from organic amnesia may later develop traumatic intrusions about these accidents. Often these intrusions do not correspond with third party accounts of the accident. As another example, Lipinski and Pope (1994) found that patients suffering from Obsessive-Compulsive Disorder may produce such vivid imagery that their therapists mistake these imaginations for flashbacks of childhood traumas. These findings underline the notion that traumatic intrusions do not necessarily represent accurate recollections.

As to the role of thought suppression, the current study found a number of significant, but modest associations between chronic thought suppression (as indexed by the WBSI) and phenomenal characteristics of traumatic intrusions. More specifically, thought suppression was correlated with hyperaccessibility characteristics (e.g., frequency, uncontrollability, intensity, and worse case scenario) of intrusions in the weeks following the incident. As well, thought suppression was positively associated with frequency of recent traumatic intrusions, perceived snapshot likeness of present-day memory of the incident, and self-reported memory loss. This pattern of results is in line with the alleged effects of thought suppression (e.g., Wegner et al., 1996). That is, hyperaccessibility in the weeks after the incident accords well with the often reported increased frequency of intrusions, while snapshot likeness and perceived memory loss suggest memory undermining effects. However, results of the structural equation modelling analyses revealed that a simple causal model in which thought suppression serves as the only antecedent of all these phenomena is unlikely. Rather, our results favour a model in which thought suppression promotes perceived snapshot likeness and, to a lesser extent, self-reported memory loss, but is not necessarily an antecedent of hyperaccessibility and recent intrusive memories. Thus, while it is tempting to interpret the significant correlation between thought suppression and hyperaccessibility (r = .21) in terms of chronic suppression fostering intense intrusions, structural

equation modelling shows that the opposite causal direction can not be ruled out. Future studies should examine whether adverse life experiences may shape chronic coping strategies such as thought suppression.

In sum, then, we found evidence to suggest that thought suppression promotes perceived snapshot likeness. However, in spite of the presence of moderate correlations, little or no support was found for the idea that thought suppression is the main vehicle behind hyperaccessibility. These findings cast doubts on Wegner et al.'s (1996) hypothesis that hyperaccessibility of specific scenes is the cause of perceived snapshot likeness. By their view, suppression may paradoxically result in more intrusions, which in turn leads to a perceived snapshot likeness of one's memory. Yet, the current results suggest that hyperaccessibility of intrusions does not function as a *conditio sine qua non* in the causal chain between thought suppression and perceived snapshot likeness.

A number of limitations of the present study need to be acknowledged. For one thing, the present study was based on cross-sectional self-reports. Furthermore, we used a broad definition of trauma and relied on a non-clinical sample. Future research is needed to further investigate the precise mechanism by which thought suppression promotes perceived snapshot likeness of traumatic memories.

4.5 Overview of findings

This chapter focused on the influence of thought suppression on the frequency and content of traumatic intrusions and memories. There is reason to believe that the influence of thought suppression on traumatic intrusions may differ from that on synthetic, obsessional intrusions. That is, unlike discrete obsessional intrusions, traumatic intrusions are based on elaborated pieces of autobiographical memory. Thus, thought suppression may not only affect the frequency of subsequent traumatic intrusions, but also their content. Indeed, Wegner, Quillian, and Houston (1996) found evidence to suggest that suppression of episodic recollections results in alteration of certain features of these recollections. More specifically, these authors argued that suppression has memory undermining effects. Participants in their study who saw a film clip and were subsequently instructed to suppress any thoughts of that film for 5 hours, reported their memory of the film to be more fragmented, snapshot like than did participants who had not received suppression instructions. Furthermore, suppression participants performed worse on memory tests containing questions with respect to the chronology of the film. In short, Wegner et al. (1996) reasoned that suppression has a negative effect on meta-memory (i.e., perceived snapshot likeness) as well as on episodic memory and concluded that "the snapshot effect of suppression suggests that people might indeed do something that resembles the effect attributed to classical repression" (p. 689).

Wegner et al. (1996) argue that their findings are relevant to our understanding of the special features that generally characterise traumatic memories (i.e., a combination of lively snapshots and partial amnesia; see Ehlers & Clark, 2000). In this respect, it can be considered to be a slight methodological flaw that they employed an "interesting but nontraumatic" (Wegner et al., 1996, p. 682) film clip. The study presented in paragraph 4.2 sought to enhance the ecological validity of the Wegner et al. (1996) research paradigm by using an emotional film clip. The results in this study contradict those of Wegner et al. in that they suggest that thought suppression results in hyperaccessibility of the suppressed memory. Here, suppression participants reported more film-related intrusions than controls. Furthermore, suppression was not associated with decreased memory of the film clip. On the contrary, suppression participants experienced their mental representation of the film as more vivid than did controls. Thus, the findings in this study give rise to the hypothesis that in case of neutral memories, suppression may have some, if only modest, memory undermining effects (Wegner et al., 1996), while suppression effects in case of emotional recollections seem to be more reminiscent of those seen with obsessional intrusions, in that they comprise characteristics (e.g., increased frequency, vividness) that reflect hyperaccessibility. In order to test this hypothesis, the study described in paragraph 4.3 examined the memory undermining effects of thought suppression in case of a neutral memory. Indeed, there were some indications of a memory undermining potential of thought suppression. However, as in the Wegner et al. (1996) study, the effects were small and became only evident when the memories of suppression participants were compared to those of

participants who had received the opposite instructions (i.e., thinking, elaborating), but not when compared to a no-instruction control group. This pattern raises the question how the experimental effects can best be accounted for. Are they a reflection of the memory undermining power of thought suppression, the memory enhancing effect of thinking, or the combination of both?

As mentioned before, experimental studies addressing the effect of thought suppression on memory are rare. Harvey and Bryant (1998a) conducted a study using a design similar to that of Wegner et al. (1996). However, these authors were merely interested in the number of intrusive thoughts about the film. Participants in their experiment were shown different films. Depending on which condition they were in, participants viewed a violent, humorous, or neutral film. Furthermore, half of the participants were instructed to suppress thoughts about the film, while the other half did not receive suppression instructions. The number of thoughts about the film was monitored during two 3-minute periods. Results suggested that during the first period, participants who had seen the violent film clip, experienced more film-related intrusions than participants in the other conditions. Regardless of which film participants had seen, suppression instructions resulted in fewer intrusions compared to the no-instruction control condition. During the second period (i.e., when suppression instructions were no longer applicable), however, all participants who had previously suppressed film-related thoughts displayed a thought rebound. These results suggest that the nature of the to-be-suppressed memory does not necessarily modulate the effects of suppression on the subsequent frequency of intrusions.

The study described in paragraph 4.4 addressed the mechanism behind the memory undermining effect of thought suppression. Wegner et al. (1996) offer several explanations for this effect and conclude that the most likely explanation is what can best be referred to as the "scene activation" hypothesis. According to this hypothesis, thought suppression leads, due to its paradoxical effect, to hyperaccessibility of suppressed pieces of memory. However, since a (traumatic) recollection entails elaborated information, it is not the whole memory that intrudes consciousness, but rather specific scenes. Consequently, these specific scenes become targets of suppression attempts and are thereby strengthened. The resulting specific hyperaccessibility effect may, then, overshadow the overall memory of the event. In this way, the scene activation hypothesis reconciles the well documented paradoxical effect of thought suppression known from studies of obsessional intrusions with the alleged amnestic potential relevant for models of Post Traumatic Stress Disorder (PTSD). In paragraph 4.4, the associations between cross-sectional questionnaire data on thought suppression, hyperaccessibility, snapshot likeness, and memory loss were explored by means of structural equation modelling. Results supported the idea that thought suppression may lead to perceived snapshot likeness and memory loss - even in case of traumatic memory. However, hyperaccessibility did not precede snapshot likeness in the

best fitting model, and thus the study failed to find complete support for the scene activation hypothesis.

The observed association between thought suppression and hyperaccessibility of intrusive memories suggests that suppression may result in intense intrusions that are in fact exaggerations of the original traumatic event (Merckelbach, Muris, Horselenberg, & Rassin, 1998). Safer, Christianson, Autry, and Österlund (1998) offer an explanation for this "tunnelling" effect. Traumatic events generally lead to attentional narrowing, in that the most threatening element (e.g., a gun in case of a robbery) attracts all attention of victims and witnesses. Due to this attentional narrowing, peripheral information is not encoded in memory. Later, when the person rethinks the traumatic event, the gaps in his memory of peripheral information may be filled by enlarging the central (most threatening) element. Thus, the threatening aspect is not bound by peripheral stimuli and may become overvalued. Alternatively, enlargement of certain remembered elements may be attributable to the paradoxical hyperaccessibility effect of thought suppression. Given that the association between suppression and hyperaccessibility of traumatic intrusions observed in paragraph 4.4 is correlational in nature, future studies should address the possible enlarging effect of thought suppression.

A final remark regarding the study described in paragraph 4.4 is in line. Given the observed (largely indirect) association between self-reported thought suppression tendencies and memory loss, this study seems to contradict the findings obtained in the study presented in paragraph 4.2. The experimental study of the effects of thought suppression on memory yielded results indicating that suppression leads to hyperaccessibility but not memory loss. Perhaps, the conflicting findings elucidate that idiosyncratic traumas differ from experimentally induced traumas. Alternatively, long-term effects of suppression may differ from shorter-term effects. Finally, it should be noted that long-term retrospective reports are strongly influenced by trivial factors such as the order in which questionnaires are completed (see Schwarz, 1999). For example, it may be that participants who found it hard to retrieve a traumatic incident inferred form this that they must have suppressed these memories which may have resulted in higher scores on the White Bear Suppression Inventory (see Winkielman, Schwarz, & Belli, 1998).

All in all, results from the studies described in this chapter suggest that the case for an amnestic potential of thought suppression is still weak. If thought suppression does undermine memory, this is more likely to be the case with neutral memories than with emotional, traumatic memories. Also, the mechanism behind the alleged memory undermining potential remains to be clarified.

5

GENERAL DISCUSSION

The studies presented in this thesis are centred around two main issues. Chapter 3 addressed the role of thought suppression within the cognitive theory of obsession, while chapter 4 examined the possible effects of thought suppression on episodic memory. In this chapter, the main results of the various studies will be summarised and general conclusions will be drawn.

According to Wegner (1989), the thought suppression paradigm offers a complete and satisfactory explanation for the development of obsessional intrusions. Any thought or impulse that is strongly suppressed may, due to indulgence cycles of active suppressing and subsequent rebounds, become a preoccupation and acquire obsessional qualities. In spite of this alleged generalisability of the thought suppression paradigm, some important questions are left unanswered. For example, the paradigm ignores possible motivations to engage in suppression attempts. Interestingly, a competing view (namely, the cognitive theory of obsession) does address such possible motives. By this view, the misinterpretation of intrusions is thought to be responsible for the occurrence of obsession like qualities of intrusions (e.g., increased anxiety, feelings of responsibility and guilt, and urges to engage in neutralising compulsions). Given that the misinterpretation of intrusions adds extra significance to these intrusions (resulting in more discomfort), strong suppression attempts might result. Hence, thought suppression can be incorporated into the cognitive theory of obsession. In the words of Rachman (1998a): "an inflated increase in the significance attached to an unwanted intrusive thought, such as an obsession, will lead to more vigorous and intense attempts to suppress such thoughts" (p. 393). When placed within the cognitive theory, the role of thought suppression is no longer a central one (unlike that of the misinterpretation of intrusions). Rather, in such a framework, suppression plays a maintaining role.

The studies presented in chapter 3 sought to investigate whether the thought suppression paradigm can be combined with the cognitive theory of obsession. In these studies, the responsibility bias (which is essential to the misinterpretation of intrusions) was defined in terms of "thought-action fusion" (TAF; Shafran, Thordarson, & Rachman, 1996). TAF refers to two biases: the probability bias which implies that thinking of an imaginary situation (e.g., being in a car accident) increases the likelihood that this situation will actually occur, and the morality bias which implies that thoughts (e.g., aggressive fantasies) are morally equivalent to overt actions (e.g., aggressive behaviour). The main conclusions to be drawn from the studies in chapter 3 are that TAF may well serve as a motive to engage in thought suppression. Furthermore, chapter 3 offered evidence to suggest that neither TAF nor thought suppression are restricted to Obsessive-Compulsive Disorder (OCD). Instead, it appears that both phenomena are prevalent in several other anxiety disorders. Lastly, both TAF and thought suppression tendencies can be reduced during therapy. It should be added, though, that in the pertinent study, the absence of a no-treatment control group prohibits the conclusion that the changes in TAF and thought suppression tendencies were a direct function of therapy.

As to the effects on memory, the findings in chapter 4 suggest that the case for an amnestic potential of thought suppression in case of traumatic memories is still weak. Although Wegner, Quillian, and Houston (1996) concluded that thought suppression may reduce memory of traumatic events, it should not be forgotten that these authors relied on an emotionally neutral stimulus. The study presented in paragraph 4.3 indicates that suppression of non-emotional memories may, indeed, lead to modest increases in forgetting. However, in case of emotional memories (paragraph 4.2), thought suppression seems to have consequences similar to those seen with obsessional intrusions (i.e., increased frequency and vividness of intrusive memories). The hypothesis that hyperaccessibility of specific trauma elements may result in compromised overview of the event as a whole (and thus lead to a specific form of memory loss) was not supported in a study employing correlational analysis.

In short, the findings suggest that the role of thought suppression in the development of obsessive intrusions may be more modest than originally postulated by Wegner (1989). Also, the memory undermining effect of thought suppression in case of traumatic memories (see Wegner et al., 1996) seems to be of limited magnitude.

Defining thought suppression

Wegner, Schneider, Carter, and White (1987) defined thought suppression as a conscious effort to remove a specific thought from consciousness. The paradoxical effects were attributed to a failure to distract oneself from the "forbidden" thought. Wegner (1994) argued that suppression attempts generally take the form of a search for an environmental distracter whenever the to-be-suppressed thought comes to mind. However, in spite of such distraction attempts, the target thought may re-enter consciousness. If the target thought occurs during a distraction attempt, the distracter may become associated with the target thought and, thus, start to serve as a retrieval cue, leaving the individual in need of a new distracter. Iteration of this process will result in a situation in which the individual finds himself surrounded by retrieval cues. According to Wegner (1989), this process may explain paradoxical increases of target thoughts. Wegner et al. (1987) tested this hypothesis in a separate experiment that involved a focused distraction condition. Suppression participants were instructed to try not to think of white bears for 5 minutes. Participants in the focused distraction condition received the following additional instructions: "If you do happen to think of a white bear, please try to think of a red Volkswagen instead" (p. 10). Compared to the original suppression condition, the immediate and rebound effects of thought suppression were less evident in the focused distraction condition. This pattern of results supports the idea that unfocused distraction (or environmental cueing) is the vehicle behind the paradoxical effects of thought suppression. Focused distraction did not lead to an increased number of target thoughts, because it prevented the individual from searching new distracters (see also Cioffi & Holloway, 1993; Muris, Merckelbach, & De Jong, 1993).

However, the occurrence of paradoxical increases in target thoughts due to suppression attempts does not always seem to depend on the distraction mechanism. For example, Warda and Bryant (1998) found that other means of suppressing thoughts, such as self-punishment and worrying, are also positively correlated with the number of to-be-suppressed thoughts. These results cast some doubts on the assumption that environmental cueing is a defining and therefore essential feature of thought suppression and its paradoxical effects. This, of course, raises the issue of precisely how thought suppression should be defined.

The issue of defining thought suppression is also relevant to the measurement of chronic thought suppression tendencies. Wegner and Zanakos (1994) argued that thought suppression and its paradoxical effects may not be limited to laboratory settings. These authors speculated that suppression of unwanted thoughts may be a chronic coping style which renders one vulnerable to paradoxical increases in intrusion frequency and, thus, to obsessional problems. In order to measure such chronic suppression tendencies, they introduced a 15-items self-report scale named the White Bear Suppression Inventory (WBSI). Wegner and Zanakos (1994) concluded that this scale possesses satisfactory psychometric properties (i.e., adequate reliability and validity). For example, scores on the WBSI correlate well with measures of obsessional symptoms (e.g., the Maudsley Obsessional-Compulsive Inventory; MOCI; Hodgson & Rachman, 1977). Muris, Merckelbach, and Horselenberg (1996) looked further into the reliability and validity of the WBSI and concluded, like Wegner and Zanakos (1994), that the scale possesses good psychometric qualities. Since its introduction, the WBSI has frequently been used in studies on suppression and obsessional problems. Several studies presented in this thesis relied on the WBSI as a measure of suppression tendencies. Nonetheless, the qualities of the WBSI as a measure of chronic suppression are open to discussion. Table 5.1 presents the 15 items of the WBSI. It is noteworthy that Muris et al. (1996) argue that 5 items appear to address the occurrence of unwanted intrusions rather than suppression tendencies per se. These "loss of control" items are items 2, 3, 4, 5, and 9. Yet, even the remaining 10 items do not invariably seem to pertain to thought suppression. For example, items 1, 6, 7, and 12 address the wish to stop having certain thoughts, but are silent about actual suppression attempts. Endorsement of item 14 implies experiencing unwanted thoughts and, thus, this item refers to unsuccessful suppression attempts. Item 15 addresses social coping (see Wells & Davies, 1994) rather than cognitive avoidance. Perhaps, the only true suppression items are items 8, 10, 11, and 13. Hence, the WBSI may not only measure suppression tendencies, but also unsuccessful suppression tendencies, the wish to not have certain thoughts, and the occurrence of unwanted thoughts. Given the content of WBSI items, it could be argued that this scale overlaps with measures of obsessional problems (i.e., preoccupation with certain thoughts and the occurrence of intrusions). Consequently, the correlations between the WBSI and measures of obsessional problems may be inflated (see also Nicholls, Licht, & Pearl, 1982).

Interestingly, a recent study by Rassin and Diepstraten (2000) casts some doubts on the validity of the WBSI as a pure measure of suppression. These authors asked 47 OCD patients to complete the WBSI along with the Thought Control Questionnaire (TCQ; Wells & Davies, 1994). The TCQ consists of 30 items addressing 5 possible coping strategies in case of unwanted intrusions, namely distraction, social support seeking, worrying, self-punishment, and cognitive re-appraisal of the thought. Wells and Davies introduced the TCQ in part because they believed other self-reports measuring coping styles (e.g., the WBSI) to not be sensitive enough. According to these authors, thought suppression may be achieved in several ways. In other words, thought suppression is not (only) a coping strategy, but (also) a goal that may be reached in different ways. Contrary to expectation, Rassin and Diepstraten found that WBSI scores were not correlated with TCQ-distraction. However, WBSI scores were found to correlate with TCQ-self-punishment (but see Muris et al., 1996). Furthermore, TCQ-distraction was negatively correlated with a measure of psychopathology. These authors conclude that the dynamics between thought suppression, distraction, and psychopathology as measured by self-reports apparently differ from those seen in experimental studies.

Table 5.1 *The items of the White Bear Suppression Inventory (WBSI; Wegner & Zanakos, 1994).*

Number	Item
1.	There are things I prefer not to think about
2.	Sometimes I wonder why I have the thoughts I do
3.	I have thoughts that I cannot stop
4.	There are images that come to mind that I cannot erase
5.	My thoughts frequently return to one idea
6.	I wish I could stop thinking of certain things
7.	Sometimes my mind races so fast I wish I could stop it
8.	I always try to put problems out of mind
9.	There are thoughts that keep jumping into my head
10.	Sometimes I stay busy just to keep thoughts from intruding my mind
11.	There are things that I try not to think about
12.	Sometimes I really wish I could stop thinking
13.	I often do things to distract myself from my thoughts
14.	I have thoughts that I try to avoid
15.	There are many thoughts that I have that I don't tell anyone

To sum up, although numerous studies have focused on thought suppression and its consequences for intrusive thinking, the precise mechanisms underlying its paradoxical and less paradoxical effects are not completely understood. Furthermore, the question arises whether the WBSI is a measure of thought suppression tendencies or rather a scale tapping unsuccessful suppression tendencies (hence, the name *White Bear* Suppression Inventory). Meanwhile, the means by which thoughts are suppressed (e.g., distraction, self-punishment, worrying) may influence the efficacy of thought suppression (see Wells & Davies, 1994; Wells & Papageorgiou, 1995).

Trait versus state phenomena

The validity of the WBSI touches on a related issue, that is the question of whether suppression tendencies and cognitive biases (e.g., TAF) possess temporal stability. If this is the case, questionnaires measuring these phenomena (i.e., WBSI and TAF-scale; Shafran et al., 1996) can be used to identify individuals who display thought suppression or TAF-tendencies and are therefore at risk of developing obsessional problems. As to the WBSI, Wegner and Zanakos (1994) conclude that their "data indicate that self-reports of thought suppression are reliable over time and thus fulfill an important criterion for recognition as a trait" (p. 624). According to Rassin, Merckelbach, Muris, and Schmidt (in press), TAF-scale scores are less stable over time. In an undergraduate student sample, test-retest correlation over a 3-months period was .52, while mean scores dropped from 20 to 16. Furthermore, results from the study described in paragraph 3.5 suggest that both TAF and thought suppression tendencies can be significantly reduced during the course of therapy. Lastly, Rassin (in press) found that experimental induction of a TAF-intrusion (i.e., inserting the name of a loved one into the written sentence "I hope ... will soon be in a car accident") results in a significant elevation of TAF-scale scores of students.

In short, while trait like qualities of thought suppression and TAF would make it possible to identify individuals who are at risk of developing obsessional problems, data from various studies suggest that suppression and TAF may not be all that stable. Meanwhile, the lack of trait like qualities has the possible advantage that suppression and TAF-tendencies can be changed in therapy.

Traumatic obsession

Whereas TAF and thought suppression may not possess strong temporal stability, the findings discussed in paragraph 3.5 suggest that both phenomena are prevalent in a wider range of anxiety disorders. As to thought suppression, this finding is not surprising (see Purdon, 1999). On the other hand, one might have expected TAF to be specifically related to OCD, because, in theory, TAF results in obsessional problems, but not in symptoms that are typical for other anxiety disorders. Perhaps, then, TAF emerges as an epiphenomenon in a wide diversity of disorders, while it plays an aetiological role in OCD (see also Muris, Meesters, Rassin, & Campbell, in press). A possible reason for the broad relevance of TAF is that its probability component comprises a form of magical thinking (i.e., the belief that thoughts determine external reality), which may also be implicated in other conditions such as dissociation and schizotypy (see Rassin et al., in press). Recently, Shafran, Teachman, Kerry, and Rachman (1999) discussed TAF in the light of eating disorders. "Thought-shape fusion" (TSF) implies that thinking of food rich in calories results in inflated estimates of one's weight. Such new insights suggest that cognitive (more specifically, interpretational) biases might play an important role in various disorders. Consequently, more refinements of Beck's (1976) original cognitive theory may see the light in the near future.

Interestingly, TAF may not be exclusively linked to psychopathological conditions. In social psychology literature, a TAF like phenomenon is documented in healthy people. In a typical experiment, participants are instructed to imagine themselves being in a specific situation (e.g., a car accident). When compared to pre-imagination measurement, participants tend to rate the likelihood of the situation actually occurring significantly greater after imagination. The experimental procedure has even been found to result in stronger agreement with traffic safety items (see Koehler, 1991). Thus, rudiments of TAF (more specifically, probability bias) appear to be present in healthy people.

The presence of thought suppression tendencies and cognitive biases in a wide variety of disorders invites some reflections as to the similarity of disorders distinguished in the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV; American Psychiatric Association, 1994). In this thesis, the role of thought suppression was discussed separately for OCD (chapter 3) versus Acute Stress Disorder (ASD) and Post Traumatic Stress Disorder (PTSD; chapter 4). However, OCD and PTSD share several interesting commonalties. One similarity is that obsessions, like traumatic intrusions, can be caused by exposure to a traumatic experience. According to Pitman (1993), there are over 20 identified possible causes of OCD, one of which is psychological trauma (see also Khanna, Rajendra, & Channabasavanna, 1988; McKeon, Roa, & Mann, 1984). Pitman argues that exposure to a stressful and traumatic environment (e.g., combat zone) may lead to excessive doubting and compulsive rituals such as checking whether a round of ammunition is chambered. Also, compulsive behaviours later on (i.e., after the involvement in the war has ended) may be construed both as compulsions (OCD) as well as re-experiences (PTSD). An example of such an ambiguous ritual would be patrolling one's property for signs of intrusion. Consequently, Pitman (1993) emphasises that high rates of comorbidity of OCD and PTSD are inevitable. That is, while the overall prevalence of OCD is estimated at 1%, its prevalence in PTSD patients is over 5%.

Notwithstanding the similarities between OCD and PTSD, the difference between traumatic and obsessional intrusive thoughts is still clear-cut in this example. However, this may not always be the case. Much like obsessional intrusions are not limited to OCD (Rachman & De Silva, 1978), intrusive memories do not seem to be restricted to PTSD, but also occur in the non-clinical population (Brewin, Christodoulides, & Hutchinson, 1996). As to clinically relevant intrusive memories, there is evidence to suggest that these memories are sometimes far from accurate. According to Johnson, Hashtroudi, and Lindsay (1993), people tend to distinguish memories of real events from fantasies on the basis of the vividness of perceptual and contextual details. That is, people assume that real memories contain more vivid elements than do fantasies. Bryant and Harvey (1998) found that survivors of motor vehicle accidents often experience intrusive and vivid memories of the accident. However, when the content of such memories was compared to objective reports and third party accounts of the accident, they sometimes turned out to

be completely inaccurate. Interestingly, accurate and inaccurate memories were experienced as equally vivid and detailed. Consequently, Bryant and Harvey (1998) noted that "even participants who were amnestic of their trauma and whose imagery was documented to be inconsistent with objective accounts of the trauma attributed historical accuracy to their intrusive imagery" (p. 85). Here, (obsessional) imagery tends to be mistaken for intrusive memory of a traumatic event. Similarly, Lipinski and Pope (1994) describe several cases in which alleged intrusive memories of childhood trauma turned out to be obsessional fantasies. In some cases, patients were actually diagnosed as suffering from PTSD based on their intrusive fantasies. These findings indicate that the line between different anxiety disorders (e.g., OCD and PTSD) is sometimes thin.

A cognitive theory of suppression?

In clinical psychology literature, the cognitive theory of depression is widely accepted and often praised. This theory holds that irrational beliefs (cognitive biases) are characteristic and possibly even causal factors in the development of depression. The cognitive theory of depression was extensively discussed by Beck (1976). Since its introduction, it has been adapted and applied to various other psychiatric disorders. For example, there are cognitive theories of Obsessive-Compulsive Disorder (see Rachman, 1997), Panic Disorder (see Kamieniecki, Wade, & Tsourtos, 1997), Social Phobia (see Van Niekerk, Möller, & Nortje, 1999), Schizophrenia (see Jensen & Kane, 1996), and more recently, and Eating Disorders (Shafran et al., 1999) and Post Traumatic Stress Disorder (Ehlers & Clark, 2000). All these cognitive theories share the idea that psychological complaints are attributable to irrational beliefs (or if one likes, cognitive biases).

Ironically, it can be argued that the time is right for the introduction of a cognitive theory of thought suppression, as this phenomenon seems to be surrounded by irrational beliefs. A basic distorted belief is that intrusions (whether obsessional or traumatic) are not normal, even though research indicates that a large majority of the normal population experiences intrusive thoughts (Brewin et al., 1996; Rachman & De Silva, 1978). Salkovskis (1999) goes even further and argues that intrusive thoughts are sometimes useful and comparable to creative brainstorm. A second and related biased idea is that intrusions should be suppressed. Third, the belief that thought suppression is a long-term fruitful coping strategy can definitely be termed a bias (Ehlers & Clark, 2000; Salkovskis, 1999). This bias may lead to additional distress if thought suppression does not seem to produce the intended effect. The maintenance or even increase of intrusive thoughts may be interpreted as emphasising the importance of the suppressed thought or as indicating the loss of mental control (Purdon, 1999). Beliefs about suppression might also determine its effects on memory. The studies presented in this thesis suggest that neither the obvious reason of lack of rehearsal, nor the more sophisticated scene activation hypothesis suffice as explanations of the memory undermining effects of thought suppression. Perhaps, then, the expectations of people who

engage in thought suppression may determine the precise effects of suppression on memory. That is to say, merely believing that suppression of memories leads to some sort of psychogenic amnesia may results in perceived or even actual memory loss (cf., Christianson & Bylin, 1999; Winkielman, Schwarz, & Belli, 1998).

Biased ideas concerning thought suppression may not only be prevalent in people who rely on this coping strategy, but also in scientists who study it. For one thing, it seems rather naïve to assume that suppression of any thought or impulse suffices to develop an obsessional preoccupation (as does Wegner, 1989). Even more so, since Wegner (1994) himself seems to have lowered his original claims. Whereas in 1989, suppression was proposed to provide a complete and satisfactory explanation of obsessions, Wegner's (1994) later publication offers a more balanced perspective. Now, suppression is claimed to have paradoxical effects only if the cognitive load is too high to successfully carry out suppression intentions. Some illustrative remarks by Wegner (1994) are: "At times, in short, it seems people are quite adept at influencing their thoughts, emotions, and motives" (p. 35), "It might be that people who practice thought suppression often enough, for example, develop such skilled and automatic operating processes that they become quite capable of effective suppression and suffer few intrusions from the ironic monitoring processes" (p. 48), and: "The ironic effects observed in research to date are not particularly huge. As experimental effects go, they are detectable but far from overwhelming" (p. 49).

The lack of interest in possible motivations to engage in thought suppression can be considered to be an omission in the thought suppression paradigm. Therefore, the interactions between different cognitive biases and coping styles are important topics for future studies. Furthermore, the apparent tendency to attribute trait like qualities to phenomena that may inherently be state factors should be dismissed as an unfruitful endeavour (Wegner & Zanakos, 1994). Similarly, the question seems justified whether the WBSI really measures thought suppression or rather unsuccessful thought suppression. Furthermore, it is remarkable that many thought suppression studies have been carried out, while the precise definition and underlying mechanisms are not completely understood. Also, the inflating or suppressing effects of instructions given to control participants might be an underestimated factor determining the outcome of many suppression experiments. For example, Merckelbach, Muris, Van den Hout, and De Jong (1991) argue that expression instructions (i.e., thinking as much as possible about the target thought) may lead to inflation of rebound effects, while liberal instructions (i.e., thinking of anything) may suppress such effects. Purdon (1999) adds yet another possible instruction, that is the anti-suppression instruction (forbidding participants to try to suppress the target thought).

Although Wegner (1994) recently has adopted a more conservative view regarding the paradoxical effects of thought suppression, he, at the same time, extends the relevance of the thought suppression paradigm beyond the domain of psychopathology. His theory regarding the monitoring and operating

processes makes thought suppression relevant to such broad psychological topics as concentration, sleep rhythm, lying, legal decision making (see Wenzlaff & Wegner, 2000), and social interaction in general (see also Monteith, Sherman, & Devine, 1998).

All in all, the study of thought suppression has taken such a flight that it would appear to be justified to devote a complete cognitive theory to it. Meanwhile, the studies presented in this thesis do not merit the conclusion that thought suppression is a strong causal determinant of obsessive-compulsive symptoms (see also Janeck & Calamari, 1999). They are more in favour of the notion that the underlying motive to suppress determines the obsessional qualities of intrusive thoughts. As to suppression of recollections, the emotional valence of the suppressed memory seems to be of influence to the consequences, if any.

REFERENCES

American Psychiatric Association (APA) (1994). *Diagnostic and Statistical Manual of Mental Disorders, 4th edition (DSM-IV)*. Washington: APA.

Amir, M., Kaplan, Z., Efroni, R., Levine, Y., Benjamin, J, & Kotler, M. (1997). Coping styles in post-traumatic stress disorder (PTSD) patients. *Personality and Individual Differences, 23*, 399-405.

Baum, M. (1987). Distraction during flooding (exposure): Concordance between results in animals and man. *Behaviour Research and Therapy, 25*, 227-228.

Bebbington, P.E. (1998). Epidemiology of obsessive-compulsive disorder. *British Journal of Psychiatry, 173*, 2-6.

Beck, A.T. (1976). *Cognitive therapy and the emotional disorders*. New York: International University Press.

Becker, E.S., Rinck, M., Roth, W.T., & Margraf, J. (1998). Don't worry and beware of white bears: Thought suppression in anxiety patients. *Journal of Anxiety Disorders, 12*, 39-55.

Bentler, P. (1989). *EQS structural relations program manual*. Los Angeles: BMDP Statistical Software.

Bjork, R.A. (1989). Retrieval inhibition as an adaptive mechanism in human memory. In H.I. Roediger III & F.I.M. Craik (eds.) *Varieties of memory and consciousness: Essays in honour of Endel Tulving* (pp. 309-330). Hillsdale: Lawrence Erlbaum Associates.

Borkovec, M.J. & Inz, J. (1990). The nature of worry in generalized anxiety disorder: A predominance of thought activity. *Behaviour Research and Therapy, 28*, 153-158.

Bouchard, C., Rhéaume, J., & Ladouceur, R. (1999). Responsibility and perfectionism in OCD: An experimental study. *Behaviour Research and Therapy, 37*, 239-248.

Boudewyns, P.A. & Hyer, L. (1990). Physiological response to combat memories and preliminary outcome in Vietnam veteran PTSD patients treated with direct therapeutic exposure. *Behavior Therapy, 21*, 63-87.

Bowers, K.S. & Woody, E.Z. (1996). Hypnotic amnesia and the paradox of intentional forgetting. *Journal of Abnormal Psychology, 105*, 381-390.

Brekelmans, M.H.M. (1995). *Suppression of emotional material: Effects on memory and emotion.* Unpublished laboratory report, University of Maastricht, The Netherlands.

Brett, E.A., Ostroff, R. (1985). Imagery and Post Traumatic Stress Disorder: An overview. *American Journal of Psychiatry, 142*, 417-424.

Brewin, C.R. & Andrews, B. (1998). Recovered memories of trauma: Phenomenology and cognitive mechanisms. *Clinical Psychology Review, 18*, 949-970.

Brewin, C.R., Christodoulides, J., & Hutchinson, G. (1996). Intrusive thoughts and intrusive memories in a nonclinical sample. *Cognition and Emotion, 10*, 107-112.

Brewin, C.R., Hunter, E., Carroll, F., & Tata, P. (1996). Intrusive memories in depression: An index of schema activation? *Psychological Medicine, 26*, 1271-1276.

Brewin, C.R., Reynolds, M., & Tata, P. (1999). Autobiographical memory processes and the course of depression. *Journal of Abnormal Psychology, 108*, 511-517.

Brewin, C.R., Watson, M., McCarthy, S., Hyman, P., & Dayson, D. (1998). Intrusive memories and depression in cancer patients. *Behaviour Research and Therapy, 36*, 1131-1142.

Brown, G.M. (1990). *Knowledge retrieval and frequency maps.* Ph.D. Thesis, University of Manchester.

Bryant, R.A. & Harvey, A.G. (1995). Avoidant coping style and post-traumatic stress following motor vehicle accidents. *Behaviour Research and Therapy, 33*, 631-635.

Bryant, R.A. & Harvey, A.G. (1998). Traumatic memories and pseudomemories in posttraumatic stress disorder. *Applied Cognitive Psychology, 12*, 81-88.

Calamari, J.E., Wiegartz, P.S., & Janeck, A.S. (1999). Obsessive-compulsive disorder subgroups: A symptom-based clustering approach. *Behaviour Research and Therapy, 37*, 113-125.

Cella, D.F., Perry, S.W., Kulchycky, S., & Goodwin, C. (1988). Stress and coping in relatives of burn patients: A longitudinal study. *Hospital and Community Psychiatry, 39*, 159-166.

Christianson, S. & Bylin, S. (1999). Does simulating amnesia mediate genuine forgetting for a crime event? *Applied Cognitive Psychology, 13*, 495-511.

Cioffi, D. & Holloway, J. (1993). Delayed costs of suppressed pain. *Journal of Personality and Social Psychology, 64*, 274-282.

Clare, I.C.H., Gudjonsson, G.H., Rutter, S.C., & Cross, P. (1994). The inter-rater reliability of the Gudjonsson Suggestibility Scale (Form 2). *British Journal of Clinical Psychology, 33*, 357-365.

Clark, D.A. (1992). Depressive, anxious, and intrusive thoughts in psychiatric inpatients and outpatients. *Behaviour Research and Therapy, 30*, 93-102.

Clark, D.M., Ball, S., & Pape, D. (1991). An experimental investigation of thought suppression. *Behaviour Research and Therapy, 29*, 253-257.

Clark, D.A. & Claybourn, M. (1997). Process characteristics of worry and obsessive intrusive thoughts. *Behaviour Research and Therapy, 35*, 1139-1141.

Clark, D.A. & Purdon, C. (1993). New perspectives for a cognitive theory of obsessions. *Australian Psychologist, 28*, 161-167.

Clark, D.M., Winton, E., & Thynn, L. (1993). A further experimental investigation of thought suppression. *Behaviour Research and Therapy, 31*, 207-210.

Clayton, I.C., Richards, J.C., & Edwards, C.J. (1999). Selective attention in Obsessive-Compulsive Disorder. *Journal of Abnormal Psychology, 108*, 171-175.

Cloitre, M., Cancienne, J., Brodsky, B., Dulit, R., & Perry, S.W. (1996). Memory performance among women with parental abuse histories: Enhanced directed forgetting or directed remembering? *Journal of Abnormal Psychology, 105*, 204-211.

Conway, M.A., Anderson, S.J., Larsen, S.F., Donnelly, C.M., McDaniel, M.A., McClelland, A.G.R., Rawles, R.E., & Logie, R.H. (1994). The formation of flashbulb memories. *Memory & Cognition, 22*, 326-343.

Conway, M., Howell, A., & Giannopoulos, C. (1991). Dysphoria and thought suppression. *Cognitive Therapy and Research, 15*, 153-166.

Coxon, P. & Valentine, T. (1997). The effects of the age of eyewitnesses on the accuracy and suggestibility of their testimony. *Applied Cognitive Psychology, 11*, 415-430.

Creamer, M., Burgess, P., & Pattison, P. (1992). Reaction to trauma: A cognitive processing model. *Journal of Abnormal Psychology, 101*, 452-459.

Crowne, D.P. & Marlowe, D.A. (1964). *The approval motive: Studies in evaluative dependence*. New York: Wiley.

Davies, M.I. & Clark, D.M. (1998). Thought suppression produces a rebound effect with analogue post-traumatic intrusions. *Behaviour Research and Therapy, 36*, 571-582.

Davis, P.J. & Schwartz, G.E. (1987). Repression and the inaccessibility of affective memories. *Journal of Personality and Social Psychology, 52*, 155-162.

De Jongh, A., Muris, P., Merckelbach, H., & Schoenmakers, N. (1996). Suppression of dentist-related thoughts. *Behavioural and Cognitive Psychotherapy, 24*, 117-126.

Derogatis, L.R. (1977). *SCL-90. Administration, scoring and procedures manual-I for the revised version*. Baltimore: Johns Hopkins School of Medicine.

Dugas, M.J., Gagnon, F., Ladouceur, R., & Freeston, M.H. (1998). Generalized anxiety disorder: A preliminary test of a conceptual model. *Behaviour Research and Therapy, 36*, 215-226.

Dulaney, S. & Fiske, A.P. (1994). Cultural rituals and obsessive-compulsive disorder: Is there a common psychological mechanism? *Ethos, 22*, 243-283.

Ehlers, A. & Clark, D.M. (2000). A cognitive model of posttraumatic stress disorder. *Behaviour Research and Therapy, 38*, 319-345.

Emmelkamp, P.M.G. & Aardema, A. (1999). Metacognition, specific obsessive-compulsive beliefs and obsessive-compulsive behaviour. *Clinical Psychology and Psychotherapy, 6*, 139-145.

Erdelyi, M.H. (1993). Repression: The mechanism and the defense. In: D.M. Wegner & J.W. Pennebaker (eds.) *Handbook of mental control* (pp. 126-148). New Jersey: Prentice Hall.

Esterling, B.A., L'Abate, L., Murray, E.J., & Pennebaker, J.W. (1999). Empirical foundations for writing in prevention and psychotherapy: Mental and physical health outcomes. *Clinical Psychology Review, 19*, 79-96.

Eysenck, H.J. (1985). *Decline and fall of the Freudian empire*. Harmondsworth: Middlesex.

Fiske, A.P. & Haslam, N. (1997). Is obsessive-compulsive disorder a pathology of the human disposition to perform socially meaningful rituals? Evidence of similar content. *The Journal of Nervous and Mental Disease, 185*, 211-222.

Foa, E.B. & Kozak, M.J. (1986). Emotional processing of fear: Exposure to corrective information. *Psychological Bulletin, 99*, 20-35.

Foa, E.B., Riggs, D.S., & Gershuny, B.S. (1995). Arousal, numbing, and intrusion: Symptom structure of PTSD following assault. *American Journal of Psychiatry, 152*, 116-120.

Frankel, F.H. (1990). Hypnotizability and dissociation. *American Journal of Psychiatry, 147*, 823-829.

Freeston, M.H., Ladouceur, R., Thibodeau, N., & Gagnon, F. (1991). Cognitive intrusions in a non-clinical population I: Response style, subjective experience, and appraisal. *Behaviour Research and Therapy, 29*, 585-597.

Freud, A. [1936] 1946. *The ego and the mechanisms of defense*. Translation C. Baines. New York: International Universities Press.

Freud, S. [1909] 1955. Notes upon a case of obsessional neurosis. Translation A. Strachey & J. Strachey. In J. Strachey (ed.) *The standard edition of the complete psychological works of Sigmund Freud, vol. 10*. London: Hogarth.

Frost, R.O., Steketee, G., Cohn, L., & Griess, K. (1994). Personality traits in subclinical and non-obsessive-compulsive volunteers and their parents. *Behaviour Research and Therapy, 32*, 47-56.

Gudjonsson, G.H. (1984). A new scale of interrogative suggestibility. *Personality and Individual Differences, 5*, 303-314.

Gudjonsson, G.H. (1992). *The psychology of interrogations, confessions and testimony*. Chichester: John Wiley & sons.

Gudjonsson, G.H. (1997). *Gudjonsson Suggestibility Scales*. Hove: Psychology Press.

Haaga, D.A.F. & Allison, M.L. (1994). Thought suppression and smoking relapse: A secondary analysis of Haaga (1989). *British Journal of Clinical Psychology, 33*, 327-331.

Harvey, A.G. & Bryant, R.A. (1998b). The effect of attempted thought suppression in acute stress disorder. *Behaviour Research and Therapy, 36*, 583-590.

Harvey, A.G. & Bryant, R.A. (1998a). The role of valence in attempted thought suppression. *Behaviour Research and Therapy, 36*, 757-763.

Hodgson, R.J. & Rachman, S. (1977). Obsessional-compulsive complaints. *Behaviour Research and Therapy, 15*, 389-395.

Holmes, D.S. (1990). The evidence for repression: An examination of sixty years of research. In J.L. Singer (ed.). *Repression and dissociation: Implications for personality theory, psychopathology, and health* (pp. 85-102). Chicago: The university of Chicago press.

Jacobs, B.L. (1994). Serotonin, motor activity and depression-related disorders. *American Scientist, 82*, 456-463.

James, W. (1890). *Principles of psychology*. New York: Holt.

Janeck, A.S. & Calamari, J.E. (1999). Thought suppression in Obsessive-Compulsive Disorder. *Cognitive Therapy and Research, 23*, 497-509.

Jensen, L.H. & Kane, C.F. (1996). Cognitive theory applied to the treatment of delusions of schizophrenia. *Archives of Psychiatric Nursing, 10*, 335-341.

Johnson, H.M. (1994). Processes of successful intentional forgetting. *Psychological Bulletin, 116*, 274-292.

Johnson, M.K., Foley, M.A., Suengas, A.G., & Raye, C.L. (1988). Phenomenal characteristics of memories for perceived and imagined autobiographical events. *Journal of Experimental Psychology: General, 117*, 371-376.

Johnson, M.K., Hashtroudi, S., & Lindsay, D.S. (1993). Source monitoring. *Psychological Bulletin, 114*, 3-28.

Johnson, D.R., Rosenheck, R., Fontana, A., Lubin, H., Charney, D., & Southwick, S. (1996). Outcome of intensive inpatient treatment of combat-related posttraumatic stress disorder. *American Journal of Psychiatry, 153*, 771-777.

Kamieniecki, G.W., Wade, T., & Tsourtos, G. (1997). Interpretive bias for benign sensations in Panic Disorder with Agoraphobia. *Journal of Anxiety Disorders, 11*, 141-156.

Katz, R.J. (1991). Neurobiology of Obsessive Compulsive Disorder: A serotonergic basis of Freudian repression. *Neuroscience & Biobehavioral Reviews, 15*, 375-381.

Kelly, A.E. & Kahn, J.H. (1994). Effects of suppression of personal intrusive thoughts. *Journal of Personality and Social Psychology, 66*, 998-1006.

Kessler, R.C., McGonagle, K.A., Zhao, S., Nelson, C.B., Hughes, M., Eshleman, S., Wittchen, H., & Kendler, K.S. (1994). Lifetime and 12-month prevalence of DSM-III-R psychiatric disorders in the United States. *Archives of General Psychiatry, 51*, 8-19.

Khanna, S., Rajendra, P.N., & Channabasavanna, S.M. (1988). Life events and onset of obsessive compulsive disorder. *The International Journal of Social Psychiatry, 34*, 305-309.

Kirk, J. (1983). Behavioural treatment of obsessional-compulsive patients in routine clinical practice. *Behaviour Research and Therapy, 21*, 57-62.

Koehler, D.J. (1991). Explanation, imagination, and confidence in judgment. *Psychological Bulletin, 110*, 499-519.

Koss, M.P., Figueredo, A.J., Bell, I., Tharan, M., & Tromp, S. (1996). Traumatic memory characteristics: A cross-validated mediational model of response to rape among employed women. *Journal of Abnormal Psychology, 105*, 421-432.

Kuyken, W. & Brewin, C.R. (1994). Intrusive memories of childhood abuse during depressive episodes. *Behaviour Research and Therapy, 32*, 525-528.

Kuyken, W. & Brewin, C.R. (1995). Autobiographical memory functioning in depression and reports of early abuse. *Journal of Abnormal Psychology, 104*, 585-591.

Kuyken, W. & Dalgleish, T. (1995). Autobiographical memory and depression. *British Journal of Clinical Psychology, 34*, 89-92.

Ladouceur, R., Rhéaume, J., Freeston, M.H., Aublet, F., Jean, K., Lachance, S., Langlois, F., & De Pokomandy-Morin, K. (1995). Experimental

manipulations of responsibility: An analogue test for models of obsessive-compulsive disorder. *Behaviour Research and Therapy, 33*, 937-946.

Lawrence, J.W., Fauerbach, J., & Munster, A. (1996). Early avoidance of traumatic stimuli predicts chronicity of intrusive thoughts following burn injury. *Behaviour Research and Therapy, 34*, 643-646.

Lavy, E.H. & Van den Hout, M. (1990). Thought suppression induces intrusions. *Behavioural Psychotherapy, 18*, 251-258.

Lilienfeld, S.O. & Loftus, E.F. (1998). Repressed memories and World War II: Some cautionary notes. *Professional Psychology: Research and Practice, 29*, 471-475.

Lipinski, J.F. & Pope, H.G. (1994). Do "flashbacks" represent obsessional imagery? *Comprehensive Psychiatry, 35*, 245-247.

Littrell, J. (1998). Is the reexperience of painful emotion therapeutic? *Clinical Psychology Review, 18*, 71-102.

Lopatka, C. & Rachman, S. (1995). Perceived responsibility and compulsive checking: An experimental analysis. *Behaviour Research and Therapy, 33*, 673-684.

Lyubomirsky S., Caldwell, N.D., & Nolen-Hoeksema, S. (1998). Effects of ruminative and distracting responses to depressed mood on retrieval of autobiographical memories. *Journal of Personality and Social Psychology, 75*, 166-177.

MacDonald, P.A., Antony, M.M., Macleod, C.M., & Richter, M.A. (1997). Memory and confidence in memory judgments among individuals with obsessive compulsive disorder and non-clinical controls. *Behaviour Research and Therapy, 35*, 497-505.

Macrae, C.N., Bodenhausen, G.V., Milne, A.B., & Jetten, J. (1994). Out of mind but back in sight: Stereotypes on the rebound. *Journal of Personality and Social Psychology, 67*, 808-817.

Marks, I.M. (1987). *Fears, phobias, and rituals: Panic, anxiety, and their disorders*. New York: Oxford University Press.

McFarlane, A.C. (1988). The longitudinal course of posttraumatic morbidity: The range of outcomes and their predictors. *The Journal of Nervous and Mental Disease, 176*, 30-40.

McKeon, J., Roa, B., & Mann, A. (1984). Life events and personality traits in obsessive-compulsive neurosis. *British Journal of Psychiatry, 144*, 185-189.

McNally, R.J. & Kohlbeck, P.A. (1993). Reality monitoring in obsessive-compulsive disorder. *Behaviour Research and Therapy, 31*, 249-253.

McNally, R.J., Lasko, N.B., Macklin, M.Z., & Pitman, R.L. (1995). Autobiographical memory disturbance in combat-related posttraumatic stress disorder. *Behaviour Research and Therapy, 33*, 619-630.

McNally, R.A., Metzger, L.J., Lasko, N.B., Clancy, S.A., & Pitman, R.A. (1998). Directed forgetting of trauma cues in adult survivors of childhood sexual abuse with and without posttraumatic stress disorder. *Journal of Abnormal Psychology, 107*, 596-601.

Melchert, T.P. & Parker, R.L. (1997). Different forms of childhood abuse and memory. *Child Abuse & Neglect, 21*, 125-135.

Mendolia, M., Moore, J., & Tesser, A. (1996). Dispositional and situational determinants of repression. *Journal of Personality and Social Psychology, 70*, 856-867.

Merckelbach, H., Muris, P., & Horselenberg, R. (1996). Correlates of overgeneral memories in normal subjects. *Behavioural and Cognitive Psychotherapy, 24*, 109-115.

Merckelbach, H., Muris, P., Horselenberg, R., & Rassin, E. (1998). Traumatic intrusions as 'worse case scenario's'. *Behaviour Research and Therapy, 36*, 1075-1079.

Merckelbach, H., Muris, P., Van den Hout, M., & De Jong, P. (1991). Rebound effects of thought suppression: Instruction dependent? *Behavioural Psychotherapy, 19*, 225-238.

Merckelbach, H., Muris, P., Wessel, I., & Van Koppen, P.J. (1998). The Gudjonsson Suggestibility Scale (GSS): Further data on its reliability, validity, and metacognition correlates. *Social Behavior and Personality, 26*, 203-210.

Miller, S.M. (1992). Monitoring and blunting in the face of threat: Implications for adaptation and health. In L. Montada, S.H. Filipp, & M.J. Lerner (eds.) *Life crises and experiences of loss in adulthood* (pp. 255-273). Englewood Cliffs: Erlbaum.

Mineka, S. & Sutton, S.K. (1992). Cognitive biases and the emotional disorders. *Psychological Science, 3*, 65-69.

Monteith, M.J., Sherman, J.W., & Devine, P.G. (1998). Suppression as a stereotype control strategy. *Personality and Social Psychology Review, 2*, 63-82.

Muris, P., De Jongh, A., Merckelbach, H., Postema, S., & Vet, M. (1998). Thought suppression in phobic and non-phobic dental patients. *Anxiety, Stress, and Coping, 11*, 275-287.

Muris, P., Meesters, C., Rassin, E., Merckelbach, H., & Campbell, J. (in press). Thought-action fusion and anxiety disorders symptoms in normal adolescents. *Behaviour Research and Therapy*.

Muris, P. & Merckelbach, H. (1991). Het effect van gedachte-onderdrukking: Een quasi-experiment. (The effect of thought suppression: A quasi-experiment). *Directieve Therapie, 11*, 119-126.

Muris, P. & Merckelbach, H. (1997). Suppression and dissociation. *Personality and Individual Differences, 23*, 523-525.

Muris, P., Merckelbach, H., & Clavan, M. (1997). Abnormal and normal compulsions. *Behaviour Research and Therapy, 35*, 249-252.

Muris, P., Merckelbach, H., & De Jong, P. (1993). Verbalization and environmental cueing in thought suppression. *Behaviour Research and Therapy, 31*, 609-612.

Muris, P., Merckelbach, H., & Horselenberg, R. (1996). Individual differences in thought suppression. The white bear suppression inventory: Factor structure, reliability, validity and correlates. *Behaviour Research and Therapy, 34*, 501-513.

Muris, P. Merckelbach, H., Horselenberg, R., Sijsenaar, M., & Leeuw, I. (1997). Thought suppression in spider phobia. *Behaviour Research and Therapy, 35*, 769-774.

Muris, P., Merckelbach, H., Van den Hout, M., & De Jong, P. (1992). Suppression of emotional and neutral material. *Behaviour Research and Therapy, 30*, 639-642.

Myers, L.B., Brewin, C.R., & Power, M.J. (1998). Repressive coping and the directed forgetting of emotional material. *Journal of Abnormal Psychology, 107*, 141-148.

Nederlandse Vereniging voor Psychiatrie (NVP) (1995). *Beknopte handleiding bij de diagnostische criteria van de DSM-IV*. Lisse: Swets & Zeitlinger.

Nicholls, J.G., Licht, B.G., & Pearl, R.A. (1982). Some dangers of using personality questionnaires to study personality. *Psychological Bulletin, 92*, 572-580.

Palfai, T.P., Monti, P.M., Colby, S.M., & Rohsenow, D.J. (1997). Effects of suppressing the urge to drink on the accessibility of alcohol outcome expectancies. *Behaviour Research and Therapy, 35*, 59-65.

Pennebaker, J.W. (1993). Putting stress into words: Health, linguistic and therapeutic implications. *Behaviour Research and Therapy, 31*, 539-548.

Petrie, K.J., Booth, R.J., & Pennebaker, J.W. (1998). The immunological effects of thought suppression. *Journal of Personality and Social Psychology, 75*, 1264-1272.

Pitman, R.K. (1993). Posttraumatic Obsessive-Compulsive Disorder: A case study. *Comprehensive Psychiatry, 34*, 102-107.

Pope, H.G., Hudson, J.I., Bodkin, J.A., & Oliva, P. (1998). Questionable validity of 'dissociative amnesia' in trauma victims. *British Journal of Psychiatry, 172*, 210-215.

Purdon, C. (1999). Thought suppression and psychopathology. *Behaviour Research and Therapy, 37*, 1029-1054.

Rachman, S.J. (1978). An anatomy of obsessions. *Behavioural Analysis and Modification, 2*, 253-278.

Rachman, S.J. (1981). Unwanted intrusive cognitions. *Advances in Behaviour Research and Therapy, 3*, 89-99.

Rachman, S. (1993). Obsessions, responsibility and guilt. *Behaviour Research and Therapy, 31*, 149-154.

Rachman, S. (1997). A cognitive theory of obsessions. *Behaviour Research and Therapy, 35*, 793-802.

Rachman, S. (1998a). A cognitive theory of obsessions: Elaborations. *Behaviour Research and Therapy, 36*, 385-401.

Rachman, S. (1998b). *Anxiety*. Hove: Psychology Press.

Rachman, S. & De Silva, P. (1978). Abnormal and normal obsessions. *Behaviour Research and Therapy, 16*, 233-248.

Rachman, S. & Hodgson, R. (1980). *Obsessions and compulsions*. Englewood Cliffs, NJ: Prentice Hall.

Rachman, S., Shafran, R., Mitchell, D., Trant, J., & Teachman, B. (1996). How to remain neutral: An experimental analysis of neutralization. *Behaviour Research and Therapy, 34*, 889-898.

Rachman, S., Thordarson, D.S., Shafran, R., & Woody, S.R. (1995). Perceived responsibility: Structure and significance. *Behaviour Research and Therapy, 33*, 779-784.

Radomsky, A.S. & Rachman, S. (1999). Memory bias in obsessive-compulsive disorder (OCD). *Behaviour Research and Therapy, 37*, 605-618.

Rassin, E. (in press). The contribution of thought-action fusion and thought suppression in the development of obsession-like intrusions in normal participants. *Behaviour Research and Therapy*.

Rassin, E. & Diepstraten, P. (2000). *Defining thought suppression in Obsessive-Compulsive Disorder*. Manuscript in preparation.

Rassin, E., Merckelbach, H., & Muris, P. (1997). Effects of thought suppression on episodic memory. *Behaviour Research and Therapy, 35*, 1035-1038.

Rassin, E., Merckelbach, H., & Muris, P. (in press). Paradoxical and less paradoxical effects of thought suppression: A critical review. *Clinical Psychology Review*.

Rassin, E., Merckelbach, H., Muris, P., & Schmidt, H. (in press). The thought-action fusion scale: Further evidence for its reliability and validity. *Behaviour Research and Therapy*.

Rassin, E., Merckelbach, H., Muris, P., & Spaan, V. (1999). Thought-action fusion as a causal factor in the development of intrusions. *Behaviour Research and Therapy, 37*, 231-237.

Rassin, E., Merckelbach, H., Muris, P., & Stapert, S. (1999). Suppression and ritualistic behaviour in normal participants. *British Journal of Clinical Psychology, 38*, 195-201.

Rassin, E., Muris, P., Schmidt, H., & Merckelbach, H. (2000). Relationships between thought-action fusion, thought suppression, and obsessive-compulsive symptoms: A structural equation modeling approach. *Behaviour Research and Therapy, 38*, 889-897.

Reynolds, M. & Brewin, C.R. (1998). Intrusive cognitions, coping strategies and emotional responses in depression, post-traumatic stress disorder and a non-clinical population. *Behaviour Research and Therapy, 36*, 135-147.

Reynolds, M. & Salkovskis, P.M. (1992). Comparison of positive and negative intrusive thoughts and experimental investigation of the differential effects of mood. *Behaviour Research and Therapy, 30*, 273-281.

Reynolds, M. & Tarrier, N. (1996). Monitoring of intrusions in post-traumatic stress disorder: A report of single case studies. *British Journal of Medical Psychology, 69*, 371-379.

Rhéaume, J., Freeston, M.H., Dugas, M.J., Letarte, H., & Ladouceur, R. (1995). Perfectionism, responsibility and obsessive-compulsive symptoms. *Behaviour Research and Therapy, 33*, 785-794.

Roemer, E. & Borkovec, T.D. (1994). Effects of suppressing thoughts about emotional material. *Journal of Abnormal Psychology, 103*, 467-474.

Roszell, K.D., McFall, M.E. & Malas, K.L. (1991). Frequency of symptoms and concurrent psychiatric disorder in Vietnam veterans with chronic PTSD. *Hospital and Community Psychiatry, 42*, 293-296.

Rutledge, P.C., Hollenberg, D., & Hancock, R.A. (1993). Individual differences in the Wegner rebound effect: Evidence for a moderator variable in thought rebound following thought suppression. *Psychological Reports, 72*, 867-880.

Safer, M.A., Christianson, S., Autry, M.W., & Österlund, K. (1998). Tunnel memory for traumatic events. *Applied Cognitive Psychology, 12*, 99-117.

Salkovskis, P.M. (1985). Obsessional-compulsive problems: A cognitive-behavioural analysis. *Behaviour Research and Therapy, 23*, 571-583.

Salkovskis, P.M. (1989). Cognitive-behavioural factors and the persistence of intrusive thoughts in obsessional problems. *Behaviour Research and Therapy, 27*, 677-682.

Salkovskis, P.M. (1999). Understanding and treating obsessive-compulsive disorder. *Behaviour Research and Therapy, 37*, S29-S52.

Salkovskis, P.M. & Campbell, P. (1994). Thought suppression induces intrusion in naturally occurring negative intrusive thoughts. *Behaviour Research and Therapy, 32*, 1-8.

Salkovskis, P.M., Forrester, E., & Richards, C. (1998). Cognitive-behavioural approach to understanding obsessional thinking. *British Journal of Psychiatry, 173*, 53-63.

Salkovskis, P.M. & Harrison, J. (1984). Abnormal and normal obsessions: A replication. *Behaviour Research and Therapy, 22*, 549-552.

Salkovskis, P.M. & Reynolds, M. (1994). Thought suppression and smoking cessation. *Behaviour Research and Therapy, 32*, 193-201.

Salkovskis, P., Shafran, R., Rachman, S., & Freeston, M.H. (1999). Multiple pathways to inflated responsibility beliefs in obsessional problems: Possible origins and implications for therapy and research. *Behaviour Research and Therapy, 37*, 1055-1072.

Salkovskis, P.M. & Westbrook, D. (1989). Behaviour therapy and obsessional ruminations: Can failure be turned into success? *Behaviour Research and Therapy, 27*, 149-160.

Salkovskis, P.M., Wroe, A.L., Gledhill, A., Morrison, N., Forrester, E., Richards, C., Reynolds, M., & Thorpe, S. (2000). Responsibility attitudes and interpretations are characteristic of obsessive compulsive disorder. *Behaviour Research and Therapy, 38*, 347-372.

Schumacker, R.E. & Lomax, R.G. (1996). *A beginner's guide to structural equation modeling*. Mahwah, NJ: Lawrence Erlbaum associates, publishers.

Schwarz, N. (1999). Self-reports: How the questions shape the answers. *American Psychologist, 54*, 93-105.

Schwartz, E.D., Kowalski, J.M., & McNally, R.J. (1993). Malignant memories: Post-traumatic changes in memory in adults after a school shooting. *Journal of Traumatic Stress, 6*, 545-553.

Shafran, R. (1997). The manipulation of responsibility in obsessive-compulsive disorder. *British Journal of Clinical Psychology, 36*, 397-407.

Shafran, R., Teachman, B.A., Kerry, S., & Rachman, S. (1999). A cognitive distortion associated with eating disorders: Thought-shape fusion. *British Journal of Clinical Psychology, 38*, 167-179.

Shafran, R., Thordarson, D.S., & Rachman, S. (1996). Thought-action fusion in Obsessive Compulsive Disorder. *Journal of Anxiety Disorders, 10*, 379-391.

Shipherd, J.C. & Beck, J.G. (1999). The effects of suppressing trauma-related thoughts on women with rape-related posttraumatic stress disorder. *Behaviour Research and Therapy, 37*, 99-112.

Smári, J., Birgisdóttir, A.B., & Brynjólfsdóttir, B. (1995). Obsessive-compulsive symptoms and suppression of personally relevant unwanted thoughts. *Personality and Individual Differences, 18*, 621-625.

Smári, J., Sigurjónsdóttir, H., & Sæmundsdóttir, I. (1994). Thought suppression and obsession-compulsion. *Psychological Reports, 75*, 227-235.

Smith, P. & Gudjonsson, G.H. (1995). Confabulation among forensic inpatients and its relationship with memory, suggestibility, compliance, anxiety, and self-esteem. *Personality and Individual Differences, 19*, 517-523.

Solomon, Z., Shalev, A., Spiro, S., Dolev, A., Bleich, A., Waysman, M., & Cooper, S. (1992). Negative psychometric outcomes: Self-report measures and a follow-up telephone survey. *Journal of Traumatic Stress, 5*, 225-246.

Southwick, S.M., Morgan, C.A., Nicolaou, A.L., & Charney, D.S. (1997). Consistency of memory for combat-related traumatic events in veterans of Operation Desert Storm. *American Journal of Psychiatry, 154*, 173-177.

Summerfeldt, L.J., Richter, M.A., Antony, M.M., & Swinson, R.P. (1999). Symptom structure in obsessive-compulsive disorder: A confirmatory factor-analytic study. *Behaviour Research and Therapy, 37*, 297-311.

Tallis, F. (1997). The neuropsychology of obsessive-compulsive disorder: A review and consideration of clinical implications. *British Journal of Clinical Psychology, 36*, 3-20.

Tallis, F. & De Silva, P. (1992). Worry and obsessional symptoms: A correlational analysis. *Behaviour Research and Therapy, 30*, 103-105.

Tallis, F., Pratt, P., & Jamani, N. (1999). Obsessive compulsive disorder, checking, and non-verbal memory: A neuropsychological investigation. *Behaviour Research and Therapy, 37*, 161-166.

Terr, L.C. (1991). Childhood traumas: An outline and overview. *American Journal of Psychiatry, 148*, 10-19.

Terr, L. (1993). *Unchained memories: True stories of traumatic memories lost and found*. New York: Basic books.

Trinder, H. & Salkovskis, P.M. (1994). Personally relevant intrusions outside the laboratory: Long-term suppression increases intrusion. *Behaviour Research and Therapy, 32*, 833-842.

Van den Hout, M., Merckelbach, H., & Pool, K. (1996). Dissociation, reality monitoring, trauma and thought suppression. *Behavioural and Cognitive Psychotherapy, 24*, 97-108.

Van der Kolk, A. & Fisler, R. (1995). Dissociation and the fragmentary nature of traumatic memories: Overview and exploratory study. *Journal of Traumatic Stress, 8*, 505-525.

Van Niekerk, J.K., Möller, A.T., & Nortje, C. (1999). Self-schemas in social phobia and panic disorder. *Psychological Reports, 84*, 843-854.

VanOyen Witvliet, C. (1997). Traumatic intrusive imagery as an emotional memory phenomenon: A review of research and explanatory information processing theories. *Clinical Psychology Review, 17*, 509-536.

Vaughan, K. & Tarrier, N. (1992). The use of image habituation training with post-traumatic stress disorder. *British Journal of Psychiatry, 161*, 658-664.

Ward, G. & Carroll, M. (1997). Reality monitoring for sexual abuse memories. *Applied Cognitive Psychology, 11*, 293-304.

Warda, G. & Bryant, R.A. (1998). Thought control strategies in acute stress disorder. *Behaviour Research and Therapy, 36*, 1171-1175.

Warren, R., Zgourides, G., & Jones, A. (1989). Cognitive bias and irrational belief as predictors of avoidance. *Behaviour Research and Therapy, 27*, 181-188.

Wegner, D.M. (1989). *White bears and other unwanted thoughts: Suppression, obsession, and the psychology of mental control.* London: The Guilford press.

Wegner, D.M. (1994). Ironic processes of mental control. *Psychological Review, 101*, 34-52.

Wegner, D.M. & Erber, R. (1992). The hyperaccessibility of suppressed thoughts. *Journal of Personality and Social Psychology, 63*, 903-912.

Wegner, D.M., Quillian, F., & Houston, C. (1996). Memories out of order: Thought suppression and the disassembly of remembered experience. *Journal of Personality and Social Psychology, 71*, 680-691.

Wegner, D.M., Schneider, D.J., Carter, S.R., & White, T.L. (1987). Paradoxical effects of thought suppression. *Journal of Personality and Social Psychology, 53*, 5-13.

Wegner, D.M., Schneider, D.J., Knutson, B., & McMahon, S.R. (1991). Polluting the stream of consciousness: The effect of thought suppression on the mind's environment. *Cognitive Therapy and Research, 15*, 141-152.

Wegner, D.M., Shortt, J.W., Blake, A.W., & Page, M.S. (1990). The suppression of exciting thoughts. *Journal of Personality and Social Psychology, 58*, 409-418.

Wegner, D.M. & Zanakos, S. (1994). Chronic thought suppression. *Journal of Personality, 62*, 615-640.

Wells, A. & Davies, M.I. (1994). The thought control questionnaire: A measure of individual differences in the control of unwanted thoughts. *Behaviour Research and Therapy, 32*, 871-878.

Wells, A. & Morrison, A.P. (1994). Qualitative dimensions of normal worry and normal obsessions: A comparative study. *Behaviour Research and Therapy, 32*, 867-870.

Wells, A. & Papageorgiou, C. (1995). Worry and the incubation of intrusive images following stress. *Behaviour Research and Therapy, 33*, 579-583.

Wenzlaff, R.M. & Bates, D.E. (1998). Unmasking a cognitive vulnerability to depression: How lapses in mental control reveal depressive thinking. *Journal of Personality and Social Psychology, 75*, 1559-1571.

Wenzlaff, R.M. & Wegner, D.M. (2000). Thought suppression. *Annual Review of Psychology, 51*, 59-91.

Wenzlaff, R.M., Wegner, D.M., & Roper, D. (1988). Depression and mental control: The resurgence of unwanted negative thoughts. *Journal of Personality and Social Psychology, 55*, 882-892.

Wessel, I. (1997). *Attentional narrowing as a model for partial amnesia*. Ph.D. thesis, Maastricht University, Maastricht: Datawyse.

Wessel, I. & Merckelbach, H. (1994). Characteristics of traumatic memories in normal subjects. *Behavioural and Cognitive Psychotherapy, 22*, 315-324.

Wilhelm, S., McNally, R.J., Baer, L., & Florin, I. (1997). Autobiographical memory in obsessive-compulsive disorder. *British Journal of Clinical Psychology, 36*, 21-31.

Williams, J.M.G. (1992). Autobiographical memory and emotional disorders. In S. Christianson (ed.) *The handbook of emotion and memory: Research and theory* (pp. 451-477). London: Lawrence Erlbaum Associates, Publishers.

Williams, J.M.G. (1996). Depression and the specificity of autobiographical memory. In D. Rubin. (ed.) *Remembering our past: Studies in autobiographical memory* (pp. 244-267). Cambridge: Cambridge University Press.

Williams, J.M.G., Watts, F.N., MacLeod, C., & Mathews, A. (1997). *Cognitive psychology and emotional disorders*. Chichester: John Wiley & sons.

Winkielman, P., Schwarz, N., & Belli, R.F. (1998). The role of ease of retrieval and attribution in memory judgements: Judging your memory as worse despite recalling more events. *Psychological Science, 9*, 124-126.

Woody, S.R., Steketee, G., & Chambless, D.L. (1995). The usefulness of the obsessive compulsive scale of the symptom checklist-90-revised. *Behaviour Research and Therapy, 33*, 607-611.

SAMENVATTING

Beperkingen van het gedachteonderdrukkingsparadigma als model van obsessieve intrusies en geheugenverlies

Meer dan tien jaar geleden rapporteerden Wegner, Schneider, Carter en White (1987) hun inmiddels beroemde "witte beer" experimenten. De centrale conclusie die zij uit deze experimenten trokken is dat pogingen om bepaalde gedachten uit het bewustzijn te bannen gedoemd zijn te falen. Bovendien blijkt dergelijke gedachteonderdrukking (suppressie) tot gevolg te hebben dat op een later tijdstip (wanneer de experimentele instructie niet meer van toepassing is) zelfs meer intrusies het bewustzijn binnendringen. Wegner et al. (1987) onderzochten dit door hun proefpersonen te instrueren niet aan een witte beer te denken. Dientengevolge staan de paradoxale effecten van suppressie (dat wil zeggen het onmiddellijke falen en de later optredende "rebound" van intrusies) ook wel te boek als "witte beer" effecten.

De witte beer effecten werden oorspronkelijk gebruikt als verklaring voor het ontstaan van obsessies zoals die optreden bij de Obsessief-Compulsieve Stoornis (OCS; Nederlandse Vereniging voor Psychiatrie [NVP], 1995). Obsessies worden in de Nederlandse handleiding bij de Diagnostic and Statistical Manual of Mental Disorders (DSM-IV) gedefinieerd als "recidiverende en aanhoudende gedachten, impulsen of voorstellingen, die gedurende bepaalde momenten van de stoornis als opgedrongen en misplaatst beleefd worden, en die duidelijke angst of lijden veroorzaken" (NVP, 1995, p. 254), terwijl compulsies worden omschreven als "zich herhalend gedrag (bijvoorbeeld handenwassen, opruimen, controleren) of psychische activiteit (bijvoorbeeld bidden, tellen, in stilte woorden herhalen) waartoe betrokkene zich gedwongen voelt in reactie op een dwanggedachte, of zich aan regels houden die rigide moeten worden toegepast; de gedragingen of psychische activiteiten zijn gericht op het voorkómen van een bepaalde gevreesde gebeurtenis of situatie; deze gedragingen of psychische activiteiten tonen echter geen realistische samenhang met de gebeurtenis die geneutraliseerd of voorkomen moet worden, of zijn duidelijk overdreven" (p. 254).

Opmerkelijk genoeg zijn obsessies en compulsies niet geheel exclusief voor OCS. Uit onderzoek volgt namelijk dat ook mensen in de niet-klinische populatie aangeven intrusies te ervaren en rituelen uit te voeren (Rachman & De Silva, 1978; Muris, Merckelbach & Clavan, 1997). Het verschil tussen "normale" intrusies en rituelen enerzijds, en klinische obsessies en compulsies anderzijds is niet gelegen in hun inhoud, maar veeleer in kenmerken als frequentie, duur, intensiteit, ervaren zinloosheid, weerzin en weerstand, met dien verstande dat dergelijke karakteristieken sterker aanwezig zijn bij de klinische varianten.

Het verschil tussen normale intrusies en klinische obsessies kan volgens Wegner (1989) worden verklaard met het suppressieparadigma. Het wegdrukken van een gedachte zal namelijk leiden tot een toename van het aantal intrusies. Deze toename heeft op haar beurt weer tot gevolg dat meer

pogingen tot suppressie zullen worden ondernomen. De aldus ontstane vicieuze cirkel zal op den duur leiden tot preoccupatie en ook tot verstoring van het dagelijks leven en het optreden van angsten. Aldus kan de ontwikkeling van obsessies worden verklaard. Het afgelopen decennium zag een veelheid aan suppressiestudies. Het onderzoek naar deze vermijdende mentale controle strategie heeft zich niet beperkt tot obsessies, maar bestrijkt een scala aan intrusies die alle het doelwit van suppressiepogingen kunnen worden. Zo is suppressie onderzocht bij depressie, verslaving, fobieën en Post Traumatische Stress Stoornis (PTSS). Bij de laatstgenoemde stoornis is een kanttekening op haar plaats. De intrusies waarvan bij PTSS sprake is, bestaan niet uit een enkelvoudige zin of impuls, maar betreffen geëlaboreerde herinneringen aan een meegemaakte traumatische gebeurtenis. Hierdoor heeft suppressie mogelijk niet slechts gevolgen voor het aantal intrusies, maar ook voor de inhoud van die intrusies en de herinnering aan het trauma. Grosso modo kunnen twee alternatieve effecten van suppressie op het geheugen worden onderscheiden. Enerzijds is het mogelijk dat (de paradoxale effecten indachtig) suppressie leidt tot een versterking van het geheugenpad. Anderzijds wordt door leken maar ook in de klinische literatuur (zie Terr, 1993) nogal eens geopperd dat verdringing van ongewenste herinneringen daadwerkelijk resulteert in verslechtering van het geheugen (dissociatieve amnesie). Experimenteel onderzoek naar de effecten van suppressie op het episodisch geheugen ontbreekt nagenoeg. Alleen Wegner, Quillian en Houston (1996) beschreven een onderzoek naar dergelijke effecten en concludeerden dat suppressie een kleine, specifieke, maar niettemin significante negatieve invloed op het geheugen heeft.

Waar het onderzoek naar de invloed van mentale controle technieken op herinneringen geen lange traditie kent, is de relatie tussen eenvoudige (obsessieve) intrusies en suppressie veelvuldig onderzocht. In het algemeen is het paradoxale effect van suppressie daarbij als een robuust fenomeen naar voren gekomen. Wegner (1989) concludeert dan ook dat "an obsession can grow from nothing but the desire to suppress a thought" (p. 167). De kracht van het suppressieparadigma is blijkens dit citaat onder meer gelegen in het idee dat het onderdrukken van gedachten een afdoende verklaring vormt voor het ontstaan van een obsessie. In deze vermeende kracht schuilt echter eveneens een zwakte. De vraag rijst namelijk of de paradoxale effecten van suppressie extrapoleerbaar zijn buiten laboratoriumsettings. Met andere woorden: los van de experimentele bevinding dat suppressie resulteert in meer intrusies, rijst de vraag waarom mensen in hun dagelijkse omgeving geneigd zouden zijn om gedachten te onderdrukken. Een antwoord op deze vraag zou gevonden kunnen worden in de "cognitieve theorie van obsessies" (Rachman, 1993, 1997, 1998; Salkovskis, 1985). Deze theorie gaat niet primair in op de manier waarop mensen met intrusieve gedachten omgaan, maar veeleer op de interpretatie die ze aan hun intrusies geven. Zo is het denkbaar dat eenzelfde intrusie door twee verschillende personen zeer uiteenlopend wordt geïnterpreteerd en aldus differentiële gevolgen heeft voor hun psychisch welbevinden. Neem de impuls "ik heb zin om iemand te vermoorden". Deze intrusie zal door de meeste

mensen als vreemd, maar niet als zeer verontrustend worden ervaren. Soms zal deze gedachte zelfs verklaarbaar lijken. Er zijn echter wellicht ook mensen die impliciete stelregels hanteren zoals "mijn gedachten verraden mijn werkelijke intenties", "het hebben van een verwerpelijke gedachte is eigenlijk even ernstig als het daadwerkelijk uitvoeren van die gedachte", of "mijn gedachten bezitten voorspellende waarde". Zulke al te strenge stelregels vallen onder wat in de literatuur "cognitieve biases" (mentale vertekeningen) worden genoemd en plaatsen de bovengeschetste intrusie in een ander licht. Een dergelijke intrusie kan in aanwezigheid van een cognitieve bias zelfs obsessieve kwaliteiten verkrijgen. Het is derhalve denkbaar dat cognitieve biases aan de basis staan van sterke suppressieneigingen. Rachman (1998) verwoordt dit als volgt: "an inflated increase in the significance attached to an unwanted intrusive thought, such as an obsession, will lead to more vigorous and intense attempts to suppress such thoughts" (p. 393). De mogelijke interactie tussen interpretaties van intrusies en mentale controle pogingen is nog nauwelijks onderzocht.

Dit proefschrift bestaat uit 5 hoofdstukken, die samen 8 op zichzelf staande studies bevatten. Na een inleidend eerste hoofdstuk, biedt hoofdstuk 2 een literatuuroverzicht van het onderzoek naar suppressie. Aan de orde komen vragen als: Wat is suppressie en hoe kunnen de effecten ervan worden verklaard? Bij welke psychopathologische syndromen speelt suppressie een rol en welke rol is dat dan? Wat zijn de therapeutische implicaties van het suppressie-onderzoek? Ook worden problemen van dit type onderzoek (definiëring, causaliteit) besproken en wordt aandacht besteed aan mogelijke toekomstige onderzoeksvragen.

Hoofdstuk 3 bevat 4 studies die beogen de inzichten verkregen uit het suppressieparadigma te combineren met die uit de cognitieve theorie van obsessies. Paragraaf 3.2 betreft een correlationele studie naar het verband tussen suppressie en compulsieve handelingen in gezonde deelnemers. De resultaten van dit onderzoek suggereren dat suppressie is geassocieerd met klinische karakteristieken (intensiteit, ongemak, weerstand) van compulsies. Ofschoon deze relatie uitnodigt tot een interpretatie waarin suppressie intrusies intensiveert (met als gevolg dat neutraliserende rituelen in toenemende mate nodig worden geacht), maakt de correlationele aard van het verband dergelijke causale interpretaties problematisch. Zo is het eveneens denkbaar dat respondenten met veel rituelen daarom een sterke behoefte voelen om die rituelen te onderdrukken.

In paragraaf 3.3 wordt een experiment beschreven waarin de helft der deelnemers (gezonde adolescenten) werd verteld dat de elektroden die op hun hoofd waren geplakt hun gedachten konden registreren. Bovendien werd hun verteld dat elke keer wanneer ze het woord "appel" dachten, een andere deelnemer een aversieve elektrische prikkel zou krijgen. Met deze instructie werd beoogd een cognitieve bias uit te lokken, te weten "thought-action fusion" (TAF; Shafran, Thordarson & Rachman, 1996). Bij het andere deel van de proefpersonen werden eveneens elektroden geplakt, maar aan hen werd geen verdere instructie gegeven. Uit de resultaten volgde dat de geïnduceerde bias een intensiverende werking had op intrusies. Zo rapporteerden deelnemers in

de experimentele conditie meer gedachten aan appels, meer weerzin daartegen en meer pogingen tot suppressie ervan.

Paragraaf 3.4 beschrijft een correlationele studie naar het verband tussen TAF, suppressie en obsessief-compulsieve symptomen. De correlaties werden verder geanalyseerd met structural equation modelling. De resultaten van deze analyses suggereren dat TAF aanzet tot suppressie hetgeen vervolgens leidt tot obsessief-compulsieve klachten. Bovendien werden aanwijzingen gevonden voor het idee dat verschillende biases aanleiding geven tot verschillende mentale controle strategieën (bijvoorbeeld suppressie en het uitvoeren van neutraliserende rituelen).

In paragraaf 3.5 wordt een studie gepresenteerd naar TAF en suppressie bij verschillende angststoornissen. Patiënten vulden vragenlijsten in bij aanvang en bij beëindiging van therapie. In de onderhavige steekproef bleek geen significante correlatie aanwezig tussen TAF en suppressie. De resultaten duidden er verder op dat TAF en suppressie niet alleen prevalent zijn bij OCS patiënten, maar ook bij mensen met andere angststoornissen. Tevens bleken zowel TAF als suppressie af te nemen gedurende de behandeling.

Hoofdstuk 4 besteedt aandacht aan de effecten van suppressie van (autobiografische) herinneringen. Wegner et al. (1996) concludeerden dat suppressie een negatieve invloed heeft op het geheugen en interpreteerden deze bevinding in het licht van modellen voor PTSS. Het door hun gebruikte stimulusmateriaal betrof echter een filmfragment met een neutrale, weinig emotionele inhoud. Om de ecologische validiteit van het Wegner et al. (1996) paradigma te vergroten, werd in het experiment beschreven in paragraaf 4.2 gebruik gemaakt van een aversieve, traumatische film (een "faces of death" fragment). Deelnemers die werden geïnstrueerd om gedachten aan deze film te onderdrukken, rapporteerden 5 uur later dat hun herinnering eraan levendiger was dan deelnemers die geen suppressie-instructie hadden gekregen. Bovendien gaven suppressiedeelnemers aan meer filmgerelateerde intrusies te hebben gehad. Aldus zijn deze bevindingen in tegenspraak met de resultaten van Wegner et al. (1996). De verschillen zijn wellicht te verklaren door de verschillende emotionele lading van de gebruikte films.

Om meer inzicht in deze mogelijke verklaring te krijgen werd een experiment vergelijkbaar met dat beschreven in paragraaf 4.2 uitgevoerd (4.3). Hier werd echter een neutrale stimulus (een voorgelezen verhaal) gebruikt als te onderdrukken herinnering. In dit geval bleken er inderdaad voorzichtige aanwijzingen te zijn voor een geheugenondermijnende werking van suppressie. Voorzichtig in die zin dat de effecten slechts dan zichtbaar werden wanneer het geheugen van deelnemers in de suppressieconditie werd vergeleken met dat van deelnemers die een tegengestelde instructie kregen (dat wil zeggen, de instructie om zoveel mogelijk aan de stimulus te denken), maar niet in vergelijking met een controlegroep. Hieruit kan worden geconcludeerd dat suppressie in geringe mate kan leiden tot een versterkt geheugenverlies in geval van een neutrale herinnering, maar niet in geval van een emotionele herinnering. In dat laatste geval heeft suppressie eerder paradoxale effecten

vergelijkbaar met die zoals gerapporteerd in onderzoeken naar de effecten van suppressie op obsessieve intrusies.

Paragraaf 4.4 beschrijft een correlationele studie waarin een mogelijke verklaring voor de geheugenondermijnende werking van suppressie werd onderzocht. Volgens Wegner et al. (1996) is het verminderen van de geheugenprestatie na suppressiepogingen verenigbaar en zelfs verklaarbaar met het paradoxale effect. Zij beredeneren dat een traumatische herinnering vrij geëlaboreerd is en in beginsel een relatief lange periode beslaat (enkele minuten). Dientengevolge kan een traumatische intrusie niet de hele herinnering dekken, maar slechts enkele fragmenten daaruit. Vervolgens zullen deze fragmenten het doel van suppressiepogingen worden en daardoor frequenter het bewustzijn binnendringen. De aldus ontstane versterking ("hyperaccessibility") van een beperkt aantal fragmenten zal de herinnering voor de gebeurtenis als geheel overschaduwen, met als gevolg ervaren geheugenverlies. Deze schakering wordt door Wegner et al. (1996) "scene activation hypothesis" genoemd. In paragraaf 4.4 worden correlationele verbanden tussen zelfgerapporteerde suppressietendensen, hyperaccessibility, ervaren fragmentering en waargenomen geheugenverlies geanalyseerd middels structural equation modelling. Hoewel er een verband leek te bestaan tussen suppressie, fragmentering en geheugenverlies, leek er voor hyperaccessibility geen plaats te zijn in de gemodelleerde causaliteit. Aldus kon de scene activation hypothesis niet worden bevestigd.

Wanneer de bevindingen uit de verschillende studies in dit proefschrift kort moeten worden samengevat (zie hoofdstuk 5), ligt allereerst de conclusie voor de hand dat cognitieve biases een serieuze aanleiding lijken te vormen voor suppressiepogingen in geval van obsessieve intrusies. In die zin is er een plaats voor het suppressieparadigma weggelegd in de cognitieve theorie van obsessies. Hoewel suppressie volgens Wegner (1989) als volledige verklaring voor elke obsessie kan gelden, lijkt de rol van suppressie binnen de cognitieve theorie bescheidener. De effecten van suppressie op herinneringen vormen een weinig onderzocht onderwerp. De hier gepresenteerde studies wijzen in de richting van de conclusie dat suppressie een bescheiden geheugenondermijnende invloed heeft op neutrale herinneringen. Daarentegen doen de effecten van suppressie in geval van emotionele herinneringen eerder denken aan die die optreden bij obsessieve intrusies, dat wil zeggen een paradoxale toename van het aantal intrusies en de ervaren intensiteit van de intrusies.

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☺

PUBLICATIES

1996

Rassin, E., Muris, P. & Merckelbach, H. (1996). De pijndempende werking van eye movement desensitization and reprocessing (EMDR) is beperkt. *Directieve Therapie, 16*, 274-284.

1997

Rassin, E. (1997). De waarheid, de hele waarheid en niets dan de waarheid: Ondervraagd worden door de politie. *De Psycholoog, 32*, 490-497.

Rassin, E., Merckelbach, H. & Crombag, H. (1997). De Criteria Based Content Analysis (CBCA) als instrument om de geloofwaardigheid van getuigenverklaringen te bepalen: Een kritische notitie. *Nederlands Juristen Blad, 72*, 1923-1929.

Rassin, E., Merckelbach, H. & Muris, P. (1997). Gevolgen van suppressie voor het geheugen. *Directieve Therapie, 17*, 110-119.

Rassin, E., Merckelbach, H., & Muris, P. (1997). Effects of thought suppression on episodic memory. *Behaviour Research and Therapy, 35*, 1035-1038.

1998

Rassin, E. (1998). Onjuiste verklaringen tijdens het politieverhoor. *Justitiële Verkenningen, 24*, 74-85.

Rassin, E. (1998). Overaangiften en overbekentenissen in zedenzaken. Bespreking van Chr. Veraart, Valse zeden: valse aangiften in zedenzaken, 1997. *De Psycholoog, 33*, 271-272.

Rassin, E. & Merckelbach, H. (1998). Oneigenlijk gebruik van psychologische meetinstrumenten in de forensische context: Een reactie op Lijnse (1998). *De Psycholoog, 33*, 321-326.

Rassin, E., Merckelbach, H. & Crombag, H. (1998). Naschrift bij Herman Soppe. *Nederlands Juristen Blad, 73*, 996.

Rassin, E., Merckelbach, H., Muris, P. & Stapert, S. (1998). Suppressie en alledaagse rituelen: Een exploratief onderzoek. *Directieve Therapie, 18*, 356-365.

Rassin, E., Merckelbach, H., Spaan, V. & Muris, P. (1998). 'Thought Action Fusion' als oorzaak van intrusies. *Directieve Therapie, 18*, 389-399.

1999

Rassin, E. (1999). De rechter en de psycholoog: Betrouwbaarheids-beoordelingen van getuigenverklaringen door gedragswetenschappers. *Trema, (8)*, 302-306.

Rassin, E. (1999). Eerlijk duurt het langst ... of niet? Bespreking van A. Vrij, De Psychologie van de leugenaar: Liegen en voorgelogen worden op het werk, in de rechtszaal en thuis, 1998. *De Psycholoog, 34*, 205-206.

Rassin, E. & Merckelbach, H. (1999). Forensische expertise. Bespreking van R.A.R. Bullens (red.), Getuige deskundigen in zedenzaken: De gedragswetenschapper bij strafzaken rondom mogelijk seksueel misbruik van kinderen, 1998. *Gedrag & Gezondheid, 27*, 162-164.
Rassin, E. & Merckelbach, H. (1999). The potential conflict between clinical and judicial decision making heuristics. *Behavioral Sciences and the Law, 17*, 237-248.
Rassin, E., Merckelbach, H. & Crombag, H. (1999). Therapeuten in de rechtszaal. *Psychopraxis, 1*, 70-75.
Rassin, E., Merckelbach, H. & Crombag, H. (1999). Therapeuten in de rechtszaal: Het laatste woord. *Psychopraxis, 1*, 148-150.
Rassin, E., Merckelbach, H., Muris, P., & Spaan, V. (1999). Thought-action fusion as a causal factor in the development of intrusions. *Behaviour Research and Therapy, 37*, 231-237.
Rassin, E., Merckelbach, H., Muris, P., & Stapert, S. (1999). Suppression and ritualistic behaviour in normal participants. *British Journal of Clinical Psychology, 38*, 195-201.
Rassin, E., Merckelbach, H. & Spaan, V. (1999). Dromen als bron van pseudoherinneringen. *De Psycholoog, 34*, 314-318.

2000

Rassin, E. (2000). Bespreking van R.S.B. Kool, De strafwaardigheid van seksueel misbruik, 1999. *Tijdschrift voor Seksuologie, 24*, 117-118.
Rassin, E. (2000). Controle over onweerstaanbare impulsen. Bespreking van C.A.L. Hoogduin & C.P.F. van der Staak (red.), Behandelingsstrategieën bij ziekelijke impulsen, 1999. *De Psycholoog, 35*, 178-179.
Rassin, E. & Merckelbach, H. (2000). Interdisciplinarity in medical and psychological forensic expertise: Problems and solutions. In J.F. Nijboer & W.J.J.M. Sprangers (eds.) *Harmonisation in forensic expertise: An inquiry into the desirability of and opportunities for international standards* (pp. 145-157). Amsterdam: Thela Thesis.
Rassin, E., Muris, P., Schmidt, H., & Merckelbach, H. (2000). Relationships between thought-action fusion, thought suppression, and obsessive-compulsive symptoms: A structural equation modeling approach. *Behaviour Research and Therapy, 38*, 889-897.
Rassin, E., Muris, P., Schmidt, H. & Merckelbach, H. (2000). "Thought-action fusion" en suppressie: Een model voor obsessieve-compulsieve symptomen. *Directieve Therapie, 20*, 31-41.

In press

Rassin, E. (in press). Bewijsproblematiek in misbruikzaken: De getuigenverklaringen van jeugdige slachtoffers. *Justitiële Verkenningen*.
Rassin, E. (in press). The contribution of thought-action fusion and thought suppression in the development of obsession-like intrusions in normal participants. *Behaviour Research and Therapy*.

Rassin, E. (in press). Thought suppression, memory, and interrogative suggestibility. *Psychology, Crime and Law.*

Rassin, E., Diepstraten, P., Merckelbach, H., & Muris, P. (in press). Thought-action fusion and thought suppression in Obsessive-Compulsive Disorder. *Behaviour Research and Therapy.*

Rassin, E., Merckelbach, H., & Muris, P. (in press). Paradoxical and less paradoxical effects of thought suppression: A critical review. *Clinical Psychology Review.*

Rassin, E., Merckelbach, H., & Muris, P. (in press). Thought suppression and traumatic intrusions in undergraduate students: A correlational study. *Personality and Individual Differences.*

Rassin, E., Merckelbach, H., Muris, P., & Schmidt, H. (in press). The Thought-Action Fusion scale: Further evidence for its reliability and validity. *Behaviour Research and Therapy.*

CURRICULUM VITAE

Eric Rassin werd geboren op 24 september 1969 in Maastricht. Van 1981 tot 1987 volgde hij middelbaar onderwijs (atheneum α) aan het Sint Maartens College, te Maastricht. In 1987 begon hij aan een studie Nederlands recht aan de Universiteit Maastricht, waarvan hij het diploma behaalde in 1991. In de periode 1991-1992 vervulde hij zijn militaire dienstplicht in Oirschot. Aansluitend begon hij aan de studie geestelijke gezondheidkunde aan de Faculteit der Gezondheidswetenschappen van de Universiteit Maastricht. Het bijbehorende diploma behaalde hij, cum laude, in 1996. Het onderzoek dat ten grondslag ligt aan dit proefschrift werd uitgevoerd aan de Faculteit der Psychologie, eveneens in Maastricht, waar hij sinds april 1997 als AIO werkt.